







# UTILIZATION AND EXPENDITURES FOR PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS

## VOLUME I

### Final Report

#### Prepared for:

Health Care Financing Administration

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February 26, 1996

This report was prepared under Delivery Order No. 8, Master Contract No. 500-923-0020, with the Health Care Financing Administration, Herb Silverman, Project Officer. The views and opinions expressed in this report are those of the authors and no endorsement by DHHS or HCFA should be inferred or implied.







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# UTILIZATION AND EXPENDITURES FOR PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS

## FINAL REPORT

### 1.0 INTRODUCTION

This report contains an analysis of prescription drug spending and utilization by Medicaid recipients in eight states for the year 1992. The study states include Alabama, California, Delaware, Georgia, Kentucky, Missouri, New Jersey, and Wyoming. Analysis begins with a discussion of aggregate spending and utilization rates, followed by findings with regard to demographic determinants of drug spending, variation in utilization by Medicaid eligibility characteristic, and patterns of utilization by therapeutic groupings of drugs. This report has two volumes: Volume I contains an eight state comparative analysis; Volume II contains detailed state-by-state analyses of drug use and spending by the analytic categories described above.

### 1.1 Study Objectives

The purpose of this study is to examine the patterns and determinants of outpatient prescription drug utilization and expenditures for Medicaid beneficiaries across the above-noted eight states. This study utilizes claims and demographic data in addition to state-specific program characteristics to examine patterns of drug use and spending. State program characteristics include restrictions on the types of drugs covered, limits on the number of prescriptions and refills, prescription size, and copay provisions.

Specific study objectives are:

- to examine Medicaid prescription drug spending at the state level as a proportion of total Medicaid spending and total outpatient spending;
- to compare aggregate spending and utilization data across states that differ by reimbursement policies and spending levels;
- to examine how spending and utilization levels vary by demographic characteristics and Medicaid eligibility groupings;





- to determine how enrollment patterns (full year, part-year continuous, and part-year discontinuous) affect spending and utilization rates;
- to examine how spending varies by enrollment, demographic, and geographic variables across therapeutic drug categories;
- to analyze patterns of geographic variation as determined by urban/rural status of counties;
- to examine how states vary in spending and utilization of prescription drugs once demographic and eligibility mix of enrollees are controlled for; and
- to examine the feasibility of using MSIS data in assessing prescription drug utilization and expenditures.

## 1.2 Study Methods

Using demographic and Medicaid eligibility information on users and non-users of prescription drugs for 1992, we examined spending and use across various sub-groups of the Medicaid population. Enrollees were classified by eligibility characteristics, such as maintenance assistance status (MAS) and basis of eligibility (BOE), and by demographic characteristics, such as age, gender, race, and urbanicity. Also, Medicaid eligibles were separately examined by duration and continuity of Medicaid eligibility. In addition to examining overall use and spending, we examined use of specific therapeutic categories of drugs as defined by First DataBank's two-digit hierarchical ingredient code categorized by pharmacological classes.

Spending amounts were based on how much Medicaid paid for prescription drugs for various covered populations. Since Medicaid enrollees could have varying duration of eligibility, we normalized spending and utilization rates by calculating person-year-equivalent (PYE) counts and dividing use and spending totals by these counts. PYE counts were obtained by dividing the total number of person-months of eligibility by twelve. We also examined rates per user and per prescription. While PYE rates provide a population-based measure across users and non-users, rates per user and per prescription are conditional on use.

Using descriptive tables, we analyze utilization and spending data by demographic and Medicaid eligibility characteristics. This is followed by multivariate analysis to examine the effects of each of the various demographic and enrollment characteristics.





### 1.3 Major Findings Based on Descriptive Analysis

Using eligibility information, we calculated rates of drug use and spending per person-year-equivalent (PYE) enrollees and compared the rates across various categories of enrollees and across states. The following bullets highlight the major findings based on descriptive analysis of data.

#### Overall Differences

- Among the eight study states, Missouri had the highest prescription drug spending as a percentage of total Medicaid spending followed by Alabama and Kentucky. On average, across all eight states, prescription drug spending accounted for 9.7 percent of total Medicaid expenditures.
- States can be classified into high, medium, and low cost categories based on prescription drug cost per PYE enrollee. California, Delaware, Wyoming, and Georgia can be considered as low cost states with cost per PYE ranging from \$250 to \$290. Alabama, Kentucky, and Missouri can be considered as moderately expensive states with costs ranging from \$350 to \$380 per PYE. New Jersey was the highest cost state in terms of spending per PYE (\$457). Variations in cost across states are largely due to enrollee mix differences due to age, race, and eligibility characteristics.
- Cost per user was the highest in New Jersey and Kentucky, and lowest in Georgia and Wyoming. Rates per user and per PYE were not very different in the aggregate. We decomposed cost per PYE into cost per prescription, prescription use per user, and user to PYE ratio. We found that states vary mostly in terms of prescription costs and utilization rates per user.

#### Differences by Maintenance Assistance Status and Basis of Eligibility

- Among the categorically needy cash recipients, Alabama, New Jersey, and Kentucky had the highest cost per PYE (ranging from \$382 in Kentucky to \$429 in New Jersey) and the highest utilization per PYE (ranging from 15 prescriptions in New Jersey to 19 in Alabama) among all eight states. For the same group of enrollees, Wyoming (\$224 and 9 prescriptions, per PYE) and Missouri (\$191 and 10 prescriptions, per PYE) had the lowest cost and utilization. Alabama and Kentucky also had the highest cost rates among the non-cash categorically needy enrollees. The range of variation in relative utilization and cost across states was more pronounced among non-cash than cash enrollees. These variations are in part due to state differences in classifying enrollees into various eligibility groups.
- Children generally had the lowest use and cost rates across all states and eligibility categories. Aged, and blind and disabled enrollees had the highest use and cost rates. In New Jersey, for example, the cash-receiving children incurred costs of about \$119 per PYE (this is the highest among all states).



Costs for the aged and blind and disabled enrollees in New Jersey, on the other hand, were \$931 and \$1,114, respectively. Thus, the aged and blind and disabled enrollees incurred costs several times greater than children. Among cash and non-cash enrollees, adults cost about two to three times more than children.

- Although half of the states (California, Georgia, Kentucky, and New Jersey) had medically needy programs, only Kentucky and California had more than 100 PYE enrollees in the aged and blind and disabled categories. Cost for Kentucky was much higher than in California. Medically needy children enrollees in these two states cost about the same, but the average cost was about half as much compared with Georgia and New Jersey.
- Among the four states which reported significant numbers of aged and blind and disabled enrollees in the pre-1988 expansion category, Kentucky incurred costs per PYE about twice as much as the other states. Missouri and New Jersey, on the other hand, had the highest spending among children, about twice as much as California, Georgia, and Kentucky.
- Other than Wyoming, all states reported some enrollees in the post-1988 expansion category. Although this expansion group may contain some aged enrollees, many fall in the Qualified Medicare Beneficiaries (QMB) category. While states extend some Medicaid benefits to QMBs, these individuals are not covered for prescription drugs unless they would have otherwise qualified for Medicaid. Because of this reason, we found that the use and spending rates are very low for the aged in the post-1988 expansion group.

#### Differences by Demographic Characteristics

- We found that utilization increases with age. This is consistent with previous studies and the hypothesis that as age increases, the need for prescription drugs increases due to deteriorating health status. Children between the ages of 6 and 18 used the least number of prescriptions, and for most states, the oldest enrollees (age 75 and above) used the most.
- Across all states, females used more drugs per PYE and incurred higher costs per PYE than males. This finding is also consistent with prior studies. The highest gender differential was found in Alabama where females incurred costs 52 percent greater than males. The lowest was in California with females incurring costs only 3 percent more than males.
- Another finding consistent across states is that whites used more prescription drugs and incurred higher costs than blacks and Hispanics. In Missouri and New Jersey, for example, white enrollees used more than twice the number of prescription drugs per PYE relative to blacks. In California which has a significant Hispanic enrollee population, whites incur costs 3.7 times greater than Hispanics. These differences may be partly attributable to age and eligibility mix, but based on our Georgia case study, we found that significant variation between blacks and whites remain even after these





adjustments. This suggests the possibility that access barriers and/or differences in disease and treatment patterns based on race may exist.

- Four of the five states which reported rural and major urban area enrollments showed 30 to 77 percent higher use and cost rates among rural relative to major urban area enrollees. The only state where rural enrollees incurred lower costs than major urban area enrollees is California. As discussed later in the multivariate analysis, rural enrollees may be incurring higher costs because of their demographic characteristics and eligibility patterns.

### **Differences by Length of Enrollment**

- Full-year enrollees consistently used and incurred higher drug costs than part-year and discontinuous (multi-period) enrollees. Costs for part-year enrollees were only around 30 to 40 percent of the costs for full-year enrollees in most states. Full-year enrollees tend to be disproportionately older and this could account for some of the differences.

### **Differences by Therapeutic Drug Category**

- Antibiotics and psychoactives were the most frequently used drug categories across the eight study states. Antibiotics were used most frequently by children up to age 18, while psychoactive use increased with age and was the highest among those aged 45-64.
- Antibiotics and psychoactive drugs were also the highest expenditure items across all eight states. Closely following these therapeutic categories were the antihistamine/serotonin drugs, primarily composed of H2-inhibitors used to treat ulcer disease.
- Females tended to use more drugs of every type, especially the psychoactives, than their male counterparts.
- Whites tended to use and spend more than blacks and Hispanics across all therapeutic drug categories. Racial/ethnic disparities were most marked with the psychoactive class of drugs.
- The categorically needy, cash receiving blind and disabled enrollees were one of the heaviest users of all drug categories, especially the psychoactives, antibiotics, and anticonvulsants.
- Although antibiotics and psychoactives were both high use and high expenditure drug categories, several drug categories were notable either for high use or high spending. For example, analgesics were among the most frequently used drug categories across all eight study states, but were not generally included in the top 50 percent of highest expenditure drug categories. Conversely, the antihistamine/serotonin drugs, calcium antagonists, and hypotensives were high cost items but were less likely to appear in the top 50 percent most utilized therapeutic drug categories.



### Differences in Utilization and Expenditure by State Policies

- Two states – Delaware and Wyoming – had among the lowest utilization and expenditures rankings among the eight study states. These states also had the lowest number of Medicaid enrollees. At the same time, these states also had the lowest number of reimbursement restrictions, suggesting that other factors in these states were responsible for keeping prescription drug utilization and spending minimized. It is important to note that these two states did not have medically needy drug programs.
- California was the most restrictive state (in terms of number of restrictions) and also had one of the lowest drug use rates (ranked sixth) and spending rates (ranked seventh) of the eight study states. Georgia, also a fairly restrictive state, had low utilization (ranked fifth) and expenditures (ranked fifth). However, Kentucky was the second most restrictive state and had the highest utilization and third highest spending for prescription drugs. Similarly, New Jersey, which had moderate restrictions, was ranked fourth on utilization and first on spending. These findings suggest that policies intended to restrict prescription drug utilization and spending have variable impacts. These variations may be due to the lack of consistency across states in the nature of states' policies and the degree to which these policies are enforced. For example, California's prior authorization program covers three widely utilized therapeutic categories (anorectics, tranquilizers, investigational drugs), while New Jersey's PA program includes anorectics and narcotics.

#### **1.4 Multivariate Findings**

We performed multivariate regressions of use and spending rates to examine how county average mix of enrollees (in terms of demographic and eligibility characteristics) and other county characteristics affect use and spending rates.<sup>1</sup> We found that states varied considerably in terms of prescription drug use and spending rates even after controlling for Medicaid enrollment and demographic characteristics and area-specific demand variables. Controlling for the various factors explaining drug use (including age, gender, race, blind/disabled status, medically needy status, cash enrollment status, urbanicity, population and physician density and area average income), we found that New Jersey is the highest cost state in terms of Medicaid drug spending per PYE, number of prescriptions per PYE, and average cost of prescriptions. California, on the other hand, had the lowest cost per PYE and lowest rate of utilization. The difference in per capita drug cost between the New Jersey and California Medicaid programs was quite pronounced. California had several cost containment policies (including patient copay, prescription limits, prior authorization requirements, and

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<sup>1</sup>Wyoming was excluded from the multivariate analysis because of data limitations.





mandatory generic substitution) in effect. While New Jersey also had two of these four policies, it was not possible to determine how extensively those policies were implemented. Evidently, there are unaccounted factors which may explain the difference in cost between these two states.

Missouri was the second highest cost and highest utilizer state. Georgia and Kentucky ranked in the middle in terms of utilization and cost rates, respectively. Cost per prescription was the lowest in Kentucky followed by Alabama; California's cost per prescription was in the middle among the seven states.

Multivariate analysis confirmed some of the patterns we found using descriptive data. This includes higher cost rates among older children, adults and the aged relative to children less than six years of age. Spending (per PYE) is the highest among those aged 45 to 64. For the same age group and also for the very old (age 75 and above), utilization rates are significantly higher than that of children less than six years of age. Cost per prescription is the highest for two age groups, those between the ages of 19 and 44, and those between 65 and 74.

The blind and disabled enrollees spent more on prescription drugs, used more prescriptions, and spent on more expensive drugs compared with other eligibility groups. Females spent more on drugs than males. Females also used more prescriptions than males although this difference was not as significant as higher prescription prices.

Blacks spent significantly less than whites but utilization and drug price differences were not significant. This result was quite puzzling since descriptive analysis showed pronounced differences. Perhaps it can be explained by the fact that the analysis was performed at the aggregate level rather than at the person level. Moreover, the weighted regressions assigned more weights to California counties with bigger Medicaid populations, and California had the smallest black-white difference. The other race category (which includes a large number of enrollees with unknown race) has significantly higher use and cost rates. This result is consistent with descriptive findings. Without any knowledge about the composition of this group, it is difficult to infer anything meaningful.

Cash-receiving enrollees used fewer prescriptions and spent less than the non-cash and the pre-1988 expansion enrollees (omitted MAS category). Medically needy enrollees spent more because of higher costs per prescription. The post-1988 enrollees also cost more for the same reason. This later group consists of QMBs many of whom are not covered for prescription drugs. This is why the utilization rate is lower for this group.

In terms of area-level variables, we found that more Medicaid enrollees lived in areas with higher prescription costs. We also found that contrary to descriptive findings in some states, multivariate adjustment results show that urban areas use and spend more per enrollee (although cost per prescription is not different). More physicians and fewer hospital beds were



associated with a higher use rate, although hospital admissions did not affect drug utilization rate. More populated counties had a lower use rate but higher cost per prescription. Finally, low income areas had higher Medicaid drug use and spending.



## 2.0 RESEARCH ISSUES AND STUDY DESIGN

Medicaid spending on outpatient prescription drugs has been increasing very rapidly (from \$815 million in 1975 to nearly \$8 billion in 1993). Although it is not mandatory in Medicaid, every state has some form of outpatient drug benefit. About 72 percent of Medicaid beneficiaries, or 23.9 million, received drug benefits in 1993, although this figure varies by state (DHHS, 1994). Factors contributing to the growth in Medicaid spending on drugs include an increase in the number of Medicaid beneficiaries receiving drug benefits, an increase in the number of prescriptions per recipient per year, higher prescription drug prices, and the introduction of new and expensive drugs (Soumerai, *et al.*, 1993).

The increase in both prescription prices and drug benefit expenditures has prompted many states to establish cost-containment policies. Formularies, prior approval programs, generic substitution, copayments, spending limits, and audits to address fraud and over-utilization were cost-containment strategies utilized by Medicaid in the 1960s, and many continue today (Gondek, 1994).

### 2.1 Factors Affecting Prescription Drug Utilization

Many theories and models have been developed to examine the factors determining drug use (Denig, *et al.*, 1988; Stolley and Lasagna, 1969; Bush, 1978; Hemminki, 1975). The factors which influence the utilization of medical care services, including prescription drugs, by Medicaid enrollees include the enrollee's health status, enrollee's access to providers, and individual state administrative rules such as provider reimbursement rates and, perhaps, Medicaid eligibility status.

Compared to individuals with good health, those with poorer health are expected to obtain more prescriptions. Compared to individuals with good access to physicians, hospitals, and other providers/entities that are allowed to prescribe drugs, individuals that have poor access are expected to obtain fewer prescriptions. The expected effect of administrative policies depends on policy objectives such as cost containment, generic substitution, eligibility restrictions, reimbursement policy changes, etc.

While several researchers have focused on overall drug utilization in the general population, others have focused on specific patient populations. Factors that explain variation in drug utilization include both patient and state level characteristics. For the Medicaid population, various factors such as age, gender, race, and Medicaid eligibility status (e.g., Aged, Disabled, Blind, and AFDC recipients) affect the consumption of drugs. In this study, we shall examine the pattern of utilization of drugs from both demographic and eligibility perspectives.





## 2.1.1 Demographic Characteristics of Medicaid Enrollees

State variations in prescription drug utilization may be explained in part by the following demographic factors:

(a) Age: Variation in prescription drug use by age group has been documented by many authors. (Baum *et al.*, 1984; Koch, 1987; Ketzan *et al.*, 1989; Swartz *et al.*, 1991; Wells *et al.*, 1985, Moeller *et al.*, 1989). Kasper (1982) found that the use of prescription medicines is most frequent among the very young and the very old. The elderly (65 years and older) comprised 12.4 percent of the U.S. population in 1988 but accounted for 34.3 percent of retail drug expenditures (Schondelmeyer and Thomas, 1990). The effect of age on drug use depends on therapeutic category. The utilization of cardiovascular drugs and central nervous system agents increases with age, while other drugs, such as anti-infective agents, are commonly used by children and young adults. Other drugs, such as respiratory and anti-allergenic agents, and gastro-intestinal agents, are thought to have a "u-shaped" association with age, with more use at very young and very old ages.

(b) Gender: It is widely recognized that women use more health services and more prescribed medications than men (Baum, *et al.*, 1984; Koch, 1987; Moeller, *et al.*, 1989; Svarstad *et al.*, 1987). This could be due to the fact that women report more medical problems (Bush, 1978). Interestingly, researchers (Svarstad *et al.*, 1987) have also found that after removing female reproductive medical conditions, drug use differences between the genders are essentially eliminated. In a study by Solomon and Hogan (1992), however, large sex differences were found among Michigan Medicaid recipients who received zidovudine (AZT). While 61 percent of HIV-positive males received the drug, only 19 percent of HIV-positive women did.

(c) Race: The influence of race in predicting drug utilization is not clear. Although Bush (1978) suggested that whites enjoy greater access to prescription drugs than blacks, Koch (1987) documented that blacks use more prescription drugs than whites. Particular therapeutic categories of drugs often do vary by race or ethnicity because of the incidence and prevalence of particular medical conditions in different racial populations. For example, studies show that the probability of blacks receiving a psychotropic drug is significantly lower than that of whites (Swartz *et al.*, 1991; Wells *et al.*, 1985).

(d) Geographic variation: Where the patient lives also influences the prescriptions they receive. In addition, regional variation may be due to variation in the density of providers of medical services and medical personnel, marketing practices of pharmaceutical and drug distributor companies, state's administrative policies, general health and health practices of local population, and practice variation among physicians. Sometimes the reasons for these differences are not apparent. Baum, *et al.*, (1984) found that the South leads the rest of the





nation in the number of drugs prescribed per visit. However, the number of drugs per patient and per physician is greatest in the Midwest.

Other factors that may explain some of the differences in utilization across states include variations in income and education levels. However, the data sources used in this study do not provide this information, and hence we were not able to control for these factors in explaining prescription drug use.

### 2.1.2 Medicaid Eligibility Characteristics

The Medicaid Statistical Information System (MSIS) uses HCFA-2082 categories to classify Medicaid enrollees by *maintenance assistance status* (MAS) and *basis of eligibility* (BOE). The MAS categories include (1) categorically needy (cash), (2) categorically needy (non-cash), (3) medically needy, (4) pre-1988 expansion group, and (5) post-1988 expansion group. The BOE categories are: (1) aged, (2) blind and disabled, (3) children, (4) adults, and (5) other Title XIX. Enrollees can thus be analyzed solely by MAS, solely by BOE, or, following the layout of the HCFA-2082 reporting form, by MAS and BOE. Aggregate prescription drug utilization and expenditures have shown considerable variation across Medicaid eligibility groups (Holahan, 1993). In one study (Howell *et al.*, 1988), prescription drug expenses for AFDC children averaged \$24 per year, while costs for disabled recipients averaged \$215. Using Georgia data for 1985, Tudor, *et al.* (1991) found that aged enrollees on a person-year basis spent more than 14 times as much as children.

In addition to the possibility that utilization and expenditure rates might vary by Medicaid eligibility status, they also might differ by continuity and/or duration of enrollment. Therefore, for each MAS/BOE category and demographic characteristic, utilization and expenditure rates will be examined separately for those enrolled (1) for an entire year, (2) for part of the year in one continuous enrollment period, and (3) for multiple periods during the year.

The Effect of MAS/BOE on Utilization: Except for individuals classified as blind or disabled, the BOE groups correspond fairly well with age. Aged individuals are expected to use more prescriptions than adults. Adults, in turn, are expected to use more prescriptions than children. Although blind and disabled enrollees have poorer health than children and adults, it is not clear whether the blind/disabled have better or poorer health than the aged.

The effect of MAS on utilization independent of BOE, if any, would have to work its way through differential health status for individuals in a given BOE class. Medically needy enrollees are incurring medical expenses at time of enrollment and may be using more prescription drugs than other comparable eligible groups. QMBs, on the other hand, are expected to have fewer prescriptions than other aged only because states need not extend the



basic Medicaid service package to QMBs unless they would have otherwise qualified for Medicaid.

Other than the medically needy and QMBs, it is not clear how MAS might affect utilization. Individuals classified into the pre-1988 expansion group include not only individuals affected by federal legislation prior to 1988 but also individuals who would have been eligible for Medicaid in the absence of federal legislation. Children and adults in the post-1988 expansion group might differ in health status from other categorically needy children and adults. Most of the adults in the post-1988 expansion group are pregnant women or post-partum women. While these women obviously are in greater need of health services than other adults, it is not obvious whether they also need more prescriptions. There does not seem to be any apparent reason to believe that children classified into the post-1988 expansion group have different health status than children in the other categorically needy MAS groups.

The Effect of Duration/Continuity on Utilization: We classified enrollees by their duration and continuity of Medicaid enrollment: (1) enrolled for all of 1992, (2) enrolled continually, but less than all of 1992 (PY), and (3) enrolled two or more times during 1992 (DE). Hypotheses regarding differential use of prescription drugs by enrollees in the three duration/continuity groups need to take into account the expected time profile of prescription drug utilization. One may expect enrollees to utilize prescription drugs at a higher rate during the first few months of enrollment than during the later months. On the other hand, those enrolled for longer periods of time (e.g., full year) may be sicker than part-year enrollees. Thus, it is difficult to hypothesize a-priori the effect of the length of enrollment on utilization of prescription drugs.<sup>1</sup>

The effect of discontinuous Medicaid enrollment (DE individuals) on health and access to care and, thus, on prescription drug utilization, depends on several factors. For instance, once off Medicaid, health might deteriorate because of lack of medical care or because of random events. On the other hand, a new pregnancy may be the reason for re-enrollment in Medicaid and, as discussed above, it is not clear whether pregnancy *per se* is associated with higher use of prescription drugs. Some individuals – e.g., young children – may "re-enroll" in Medicaid for reasons not associated with their health status such as declines in family income. As suggested above, poor access to care while off of Medicaid might contribute to a deterioration in health. Relative to full-year enrollees, the utilization rate of DE enrollees may be higher or lower depending on the mix of enrollees and their reasons for "re-enrolling" in Medicaid. As with PY enrollees, data censoring might complicate interpretation of DE utilization rates.

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<sup>1</sup>Estimating the effect of enrollment length on drug use is difficult even in a multivariate model since unobserved factors may affect both. In this study, we examine descriptive rates for enrollees with various enrollment duration.





### 2.1.3 Medicaid Policies Affecting Prescription Drug Reimbursement

One of the goals of this study is to determine how various state reimbursement policies relating to prescription drugs affect the utilization and cost of drugs. Reimbursement policies generally fall into one of two domains: patient-level restrictions, and administrative-level restrictions (Soumerai *et al.*, 1993).

Patient-level restrictions include (1) patient co-payments, (2) limits on the number of prescriptions, and (3) the quantity of drug received per prescription. Patient cost-sharing requires recipients to pay from \$0.50 to \$3.00 toward the cost of a prescription. Prescription limits, or caps, deny coverage for prescriptions exceeding a given number of prescriptions per month. Prescription caps can also limit the number of refills a recipient may receive in a given time period and/or the quantity of drug allowed per prescription.

Studies (Liebowitz *et al.*, 1985; Lohr *et al.*, 1986; Foxman *et al.*, 1987; Harris *et al.*, 1990; Reeder and Nelson, 1985; Nelson *et al.*, 1984) have shown that the implementation of patient co-payments resulted in decreased prescription drug utilization. In a series of articles, Soumerai and colleagues (1987, 1990, 1991) found that particular limitations placed on Medicaid recipients' drug coverage decreased prescription drug utilization with notable effects on patient outcomes. For example, a cap of three prescriptions per person per month was associated with a 35 percent decline in the use of certain drugs (Soumerai *et al.*, 1991). The cap also led to an increase in nursing home admission rates.

Administrative-level restrictions have traditionally included (1) formularies, (2) therapeutic exclusions, (3) prior authorization requirements, and (4) direct reductions on pharmaceutical reimbursement. Formularies are listings of selected drugs and appropriate dosages considered to be most useful and cost-effective for patient care. Therapeutic exclusions apply to certain categories of drugs considered non-reimbursable (e.g., minor tranquilizers in some states). For certain drugs, prior authorization is required before dispensing. Direct reductions in payment may take the form of limiting dispensing fees and/or ingredient cost mark-ups. Other administrative restrictions include mandatory generic substitution, and managed care programs and policies.

Provisions of OBRA 1990 introduced striking changes in the way pharmaceuticals are purchased by state Medicaid programs. Pharmaceutical manufacturers are now required to provide rebates for drugs sold to Medicaid recipients. OBRA 1990 also mandated that states could not modify the reimbursement formula or dispensing fee used to determine Medicaid pharmacy reimbursement limits. This moratorium was effective from January 1991 through December 31, 1994. The 1990 OBRA regulations did allow states to eliminate reimbursement for drugs used to treat a short list of specific conditions.



There have been several studies of administrative restrictions (Hefner, 1979; Kozma *et al.*, 1990; Kreling, 1989). One recent study by Grabowski (1988) examined the exclusion of newly-approved prescription drugs in the formularies of six states and found that access for Medicaid patients was significantly curtailed. However, OBRA 1990 mandated that new drugs had to be covered during the first six months after their appearance on the market. After that period, states could choose to exclude them from coverage.<sup>2</sup>

The examination of state Medicaid prescription drug policies is significant for this study for two reasons: (1) the existence of various policies, or lack thereof, guided the selection of the eight states analyzed in this study; and (2) knowledge of these policies may explain variation in state prescription drug utilization and expenditures findings. By appropriate choice of states, we would like to ensure the capability of examining the impact of policy variations on prescription drug use and costs.

## 2.2 Research Questions

Medicaid is the most important public payer of prescription drugs. As such, it is important to understand the extent of utilization and sources of variation in the use of prescription drugs in the Medicaid population. MSIS data provide an unique opportunity to study the variation in utilization of prescription drugs across states with different reimbursement policies, and to examine how spending levels vary by demographic and other characteristics of Medicaid enrollees. In addition this study will also illustrate variation in utilization and spending across various therapeutic groups of drugs.

This study will address the following specific research questions.

- How significant is the level of spending on prescription drugs by the Medicaid population in relation to the total Medicaid budget?
- What was the experience in terms of prescription drug spending in states which have copayment restrictions? prescription limits? How are the high spending states different from low spending states?
- Are there systematic differences across Medicaid groups as distinguished by demographic characteristics and Medicaid's Maintenance Assistance Status (MAS) and Basis of Eligibility (BOE)?

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<sup>2</sup>The formulary and new drug provisions of OBRA 1990 were rescinded by OBRA 1993. However, OBRA 1990 policies were in effect during the study year.





- Does it matter how enrollment is measured? Are utilization and spending patterns different across enrollees who are in Medicaid for the full year, part of the year, or several times in a year?
- What is the pattern of drug use and spending across therapeutic categories in the aggregate population, and among subgroups of Medicaid enrollees as identified by demographic and MAS/BOE mix?
- How important is geographic variation in the use of prescription drugs? Do residents of urban areas utilize more drugs than residents in rural areas?
- In a multivariate model, what factors account for variation in drug use and spending across selected states?

## 2.3 Selection of States

This report analyzes data from eight states selected based on a set of criteria including levels of drug spending, prescription reimbursement limits, and copay provisions. Spending status (high/medium/low) is determined for each state by ranking states in descending order of spending per enrollee, and then taking the top one-third to represent high, the middle one-third to represent medium, and the bottom one-third to represent low spending states. States were grouped based on prescription limits (high/moderate/low), by considering four possibilities: (1) states may not have any prescription limits; (2) they may have refill limits; (3) they may have limits on the number of prescriptions; and/or (4) they may have limits on the quantity per prescription. Those states with no restrictions or only one form of restriction were considered low limit states. States with two forms of limits (e.g., a quantity limit and a refill limit) were classified as being moderate, and states with all three forms of limits were considered high limit states. Finally, some states had patient copay and some states did not.

The final set of eight states and the characteristics of those states in terms of spending and key reimbursement parameters are listed in Table 2.1. Among the states with no copayment and low prescription limit, Delaware is a low-cost and Kentucky, a high-cost state. Thus, there are obviously other factors which explain spending differences. However, a comparison of Alabama and Georgia will illustrate some of the differences due to copay provision. Alabama has copay requirements while Georgia does not. Both states have similar spending levels and prescription limits. A comparison of Georgia and New Jersey will illustrate the effect of prescription limitations. A comparison of Missouri versus California and Wyoming will illustrate the effect of prescription limits on spending when all three states have copays.<sup>3</sup>

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<sup>3</sup>We could not select any state with high prescription limit and no copay because of other considerations, including data quality and data availability.



Among the MSIS states selected, California had a significant HMO population. Since claims for HMO enrollees are not included in MSIS, HMO enrollees were eliminated from the population denominators, in order to avoid possible downward biases in the estimated rates per population.

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TABLE 2.1  
STATE SELECTION

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<u>RX LIMITS</u>	<u>COPAY</u>	
	<u>No</u>	<u>Yes</u>
Low	Delaware (Low \$) Kentucky (High \$) New Jersey (Medium \$)	Missouri (High \$)
Moderate	Georgia (Medium \$)	Alabama (Medium \$)
High		California (Low \$) Wyoming (Low \$)

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## 3.0 INTRODUCTION AND METHODS

### 3.1 MSIS Data

The Medicaid Statistical Information System (MSIS) contains person-level claims information on eligibility, recipients, utilization, and payment for state Medicaid services, and is the basis of this analysis. As of December, 1992, twenty-five states were participating in the MSIS Project. These states submit quarterly files to HCFA containing specified data elements for Medicaid eligible persons (the Eligible File) and their claims for services (the Claims Files). The Eligible File includes date of birth, sex, race/ethnicity, county and zip codes, Maintenance Assistance Status (MAS), and Basis of Eligibility (BOE). Three Claims Files are comprised of: (1) inpatient claims, (2) long-term-care claims, and (3) other claims. For our analysis, we utilized the "other" claim file (CLAIMOT) that contains prescription drug claims.

### 3.2 Analytic File Structure

Two analytic files were provided by HCFA to the investigators in this study. These files contained various MSIS data elements, including demographic, Medicaid eligibility and enrollment variables as well as utilization and payment amounts for prescription drugs. The claims file contained a variable (called Hierarchical Ingredient Code List or HICL) which permits identification and grouping of drugs by pharmacological classes using the last two digits of the HICL coding system.<sup>1</sup>

Each record in the user file consisted of two parts -- a fixed portion and a variable portion. User is defined as any enrollee who had at least one prescription drug claim. The fixed portion of the user file contained demographic and eligibility information (derived from the MSIS eligibility file), and the variable portion contained the drug use information (based on the MSIS claims file).

The second file (non-user file) provided by HCFA contained one record per Medicaid eligible who did not use any prescription drugs during the year. Some of these individuals may have been enrolled in Medicaid only part-time during the year. This file contained demographic and eligibility information on those individuals. The non-user file allowed us to calculate person-year equivalent denominators based on all enrollees.

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<sup>1</sup>The HICL scheme combines drug codes into meaningful categories based on drug ingredients and their intended therapeutic use and was developed by Joseph L. Hirschmann, of the First DataBank.





Both user and non-user files contained monthly-by-month Medicaid eligibility status. Thus, for each month of 1992, we could determine if the person was enrolled in Medicaid as of that month, and which MAS/BOE category the person belonged to. The expenditure and utilization data, however, were not separated out by month; rather, they were summarized for the year. Thus, we knew how much was spent and how many prescriptions were utilized during the year, but we could not determine how the annual total was distributed across a person's eligible months.

### 3.3 Editing the Analytic File

Table 3-1 illustrates some of the characteristics of the data files. The first column shows the total number of enrollees including users and non-users of prescription drugs. California had more than 4 million individuals and was the largest of the study states. Georgia and New Jersey were the other two states with high enrollment (883,264 and 728,840, respectively). Alabama, Kentucky, and Missouri each had about half a million enrollees. Delaware and Wyoming were two smaller states with about 61,000 and 43,000 enrollees.

The second column of Table 3-1 shows the number of individuals who did not have eligibility information. In the parentheses, we showed those without eligibility as a percentage of all reported enrollees. These percentages range from 1 percent (Delaware) to 4 percent (Georgia). Eligibility and demographic information (including MAS/BOE status, age, sex, and race) was critical to the study. In particular, it was not possible to determine person-year-equivalent (PYE) counts for any of the analytic categories without eligibility data. As such, these individuals were dropped from the analysis.

The third column of Table 3-1 shows that the extent of missing therapeutic codes varies across states; missing codes ranged from 0.22 percent in Kentucky to 10.12 percent in California. In a few instances, drug claims could not be properly matched with any of the therapeutic categories. We did not drop those observations from the aggregate analysis. However, for analyses that involved therapeutic categorization (e.g., ranking of drugs to determine which therapeutic categories account for top 50 percent of spending and utilization), we did not include records with invalid or missing therapeutic code.

The initial files contained some records with negative paid amounts. These records represent adjustments to past payments and should not have been included in the data in the first place and were eliminated from the file for this study. This problem affected only three states -- Alabama, Kentucky, and New Jersey -- and in all instances, the extent of records lost was less than one percent.





### 3.4 Analytic Categories

#### 3.4.1 Medicaid Eligibility Categories

Medicaid enrollees were classified by both Maintenance Assistance Status (MAS) and Basis of Eligibility (BOE). There are five MAS groups: (1) categorically needy receiving maintenance assistance (CNR), (2) categorically needy not receiving maintenance assistance (CNN), (3) medically needy (MN), (4) other coverage groups created by legislation passed prior to 1988 (pre-1988), and (5) coverage groups created by the Medicare Catastrophic Coverage Act (MCCA) of 1988 and later legislation (post-1988). Strictly speaking, the last two MAS groups are also considered as categorically needy (Congressional Research Service, 1993).

The medically needy group is optional for each state. Four of the study states (Alabama, Delaware, Missouri, and Wyoming) did not have a medically needy program in 1992. The pre-1988 and post-1988 MAS groups are commonly referred to as the *expansion groups*. Legislated by Congress (starting in 1984), the creation of these two MAS groups has confused states on how to "crosswalk" from eligibility legislation to reporting categories. The confusion stems from three sources. First, some individuals may be simultaneously eligible for more than one MAS group (e.g., medically needy and post-1988). Second, for some types of eligibility, HCFA changed the reporting group when the expansion groups were introduced (e.g., from the CNN to the pre-1988 MAS group).

Third, states may not know whether to classify certain individuals in the pre-1988 or post-1988 MAS group (e.g., a four-year-old child living in a family whose income is 95 percent of the Federal poverty guideline (FPG), but above the state's AFDC payment standard). The confusion about whether to classify an individual in the pre-1988 or post-1988 MAS group stems from the nature of the legislation regarding some classes of individuals. OBRA'86, for instance, *allowed* states to cover children under age five living in families with incomes up to 100 percent of the FPG while OBRA'89 *required* states to cover children under age six living in families with incomes up to 133 percent of the FPG. Some states that voluntarily adopted OBRA'86 provisions for children apparently were confused about whether to classify children in the pre-1988 or post-1988 MAS group. (Anyone originally covered in an optionally covered group later made mandatory should be reported in the post-1988 coverage group (HCFA, June 1991, p. 2-154).)

Among the study states, Delaware, Georgia, Kentucky, Missouri, and New Jersey voluntarily adopted OBRA'86 provisions for children prior to OBRA'89 (Hill, 1992). Similarly, Alabama, Delaware, Kentucky, Missouri, New Jersey, and Wyoming adopted voluntary OBRA'86 provisions for pregnant women and infants prior to the mandates enacted in MCCA'88 (Hill, 1992). We do not have similar information, however, regarding voluntary



adoption of OBRA'86 provisions concerning the aged, blind and disabled. We continued our research throughout the project to determine from other researchers using Medicaid eligibility data whether the study states were complying with HCFA reporting requirements. We found that in some instances states were not following the reporting requirements. These are discussed in the findings for individual states.

There are six BOE classes: (1) aged, (2) blind, (3) disabled, (4) child, (5) adult, and (6) other Title XIX. As commonly done, we combined the blind and the disabled into one group for analytic purposes. Only immigrants and a few other smaller groups should be assigned to the "Other Title XIX" class, but many states in the past used the "Other Title XIX" class as a catch-all class and might be still be under-reporting enrollees in other BOE classes.

### **3.4.2 Periods of Enrollment**

Utilization and expenditure rates might also vary by continuity and/or duration of enrollment. Therefore, for each MAS/BOE category and demographic characteristic, utilization and expenditure rates were also calculated separately for those (1) enrolled for an entire year, (2) enrolled continuously, but for less than the entire year, and (3) enrolled for multiple periods during the year.

In analyzing data by the above categories, sometimes there were very few enrollees. Those statistics are highlighted to warn the reader about the lack of statistical reliability.

### **3.4.3 The Effect of Data Censoring on Observed Utilization Rates**

One of the difficulties associated with interpreting Medicaid data is that enrollees are not observed for the entire period of the study. By annualizing utilization and spending rates based on part-year experience for those who are not enrolled for the full year, potential biases can be introduced. Enrollees may not be using services with the same intensity throughout the year and we may be observing either high or low utilization periods for some enrollees. On average, high and low use rates may cancel out if we are fortunate, but there is no assurance that this will happen. In fact, it is more than likely that observed months in Medicaid will not be representative of the full year for most enrollees and on average, the bias will still remain.

For example, consider an enrollee who is eligible for only three months during the year. Her spending for the entire year is estimated by annualizing her utilization total for the three month period. It is possible that she did not use prescription drugs prior to enrollment and will not use as much after her enrollment terminates. In this instance, annualized utilization will overestimate her true utilization for the full year. The opposite can also happen. She may





be using more drugs during the rest of the year than the period that she is in Medicaid, and this will underestimate the true utilization.

It is very unlikely that in the aggregate, use rate for the enrollees with higher than average utilization during the Medicaid months will offset the use rate for those with lower than average use. Children and the aged are a case in point. Most children (including newborns) who happen to be low utilizers are in Medicaid for only a part of the year. Aged and blind/disabled enrollees, on the other hand, are more likely to be enrolled for longer lengths of time (e.g., full year). Aged and blind/disabled enrollees are high utilizers. Thus, annualized utilization rate for full-year enrollees may be higher than annualized utilization for part-year enrollees simply because a larger percentage of part-year enrollees are low users.

#### **3.4.4 Demographic Characteristics**

Utilization of prescriptions and spending by Medicaid enrollees are analyzed based on various age categories, gender and race as well as place of residence. Age groups are defined as: (1) under age 1, (2) between 1 and 5, (3) 6 to 18, (4) 19 to 44, (5) 45 to 64, (6) 65 to 74, and (7) age 75 and above. This categorization enables us to examine the pattern of use for infants, children, and the very old.

Areas are grouped into three categories: (1) major urban counties (with county population in excess of 500,000), (2) other urban counties (those defined by Metropolitan Statistical Areas or MSAs but having county population less than 500,000), and (3) rural counties (non-MSA). County-level MSA designation and population size were merged on to the analytic file using existing data files at HER.

#### **3.4.5 Therapeutic Categories**

The therapeutic group variable in the analytic data file consisted of the first seven characters of the hierarchical code (called HICL). As discussed earlier, we used the first two digits of that code to identify the pharmacological class of the drug prescribed. In addition to minimizing the prospect of finding too few users in analytic cells, this classification scheme also makes simpler tables for presentation.

### **3.5 Limitations of Data**

In general, the analytic data files provided by HCFA were clean and usable. However, as a result of summarizing data to a person by therapeutic category, we did not obtain details





about the specific drug code. Thus, the therapeutic analysis could not examine within-category mix and utilization differences. Another limitation was our inability to know how much was spent on each month since the data were aggregated for the entire year. We uniformly allocated the amount across the eligible months. Since the analysis was done by analytic categories and not at the person level, this allocation was quite appropriate. As discussed earlier, there were some instances of missing therapeutic codes and some instances where we found claims without eligibility records. However, the extent of such problems was minimal. Since we were examining prescription drug utilization data for one year for only eight Medicaid states, the analysis had to be limited in terms of generalizability. Moreover, we could not examine non-drug substitution or complementarity or pre-post differences in terms of the impact of state policy changes. However, for the purpose of examining variation in drug use by demographic and enrollment categories for a limited number of states, the data were adequate.



## 4.0 MEDICAID ENROLLMENT PATTERNS ACROSS STATES

Table 4-1 shows the total number of enrollees and PYEs across states and the distribution of PYEs across MAS and BOE categories. For example, in 1992 Alabama had a total of 477,550 Medicaid eligibles enrolled for various lengths of time. We calculated person year equivalent (PYE) enrollees by dividing the total number of eligible months by 12. This resulted in a PYE total of 363,561 for Alabama. Wyoming is the smallest state in terms of the number of enrollees and PYEs (41,866 and 28,700 respectively). California is the largest state with about 4.16 million enrollees and 3.16 million PYEs. Georgia and New Jersey are the next two largest states in terms of Medicaid enrollment in 1992.

The largest percentage of PYEs were enrolled as categorically needy. This is true for all states. The percentages vary from about 50 percent in Missouri to slightly over 75 percent in New Jersey. For Alabama, Delaware, Georgia and Kentucky, the post-1988 expansion category had the second largest concentration of enrollees (with 24, 13, 15, and 12 percent of PYEs, respectively). For California, the medically needy group with about 16 percent of PYEs was about double the size of the categorically needy non-cash group. The post-1988 expansion group had only about 3 percent of total PYEs. For Missouri and New Jersey, the second largest concentration of enrollees was in the non-cash categorically needy group, with 34 and 13 percent of PYEs for Missouri and New Jersey respectively. Wyoming is the only state which did not report enrollment in the expansion categories although states were required to follow the HCFA reporting requirements. Some states, of course, did not have a medically needy program (Alabama, Delaware, Missouri, and Wyoming). Both Georgia and New Jersey had small medically needy programs.

The lower panel of Table 4-1 shows the distribution of enrollees by BOE. Among the five BOE categories, children account for most of the enrollment in all states, ranging from 43 percent in Alabama and California to 56 percent in Wyoming. Alabama is the only state with the blind and disabled as the second largest BOE group (25 percent of PYEs). Kentucky had fairly equal percentage of PYEs in the blind and disabled and adult categories. For other states, adults constitute the second largest BOE group, ranging from 20 percent in Delaware and Georgia to 26 percent in California. The aged also constitute a fairly large BOE group in most states. The percentage of PYEs reported as aged varies from 8.5 percent in Wyoming to slightly over 16 percent in Alabama.

As shown in Exhibit 4-1, there is substantial variation among states in the proportions of blind and disabled enrollees. States such as Missouri and Wyoming have only 11 to 15 percent of enrollees in this category, whereas Alabama and Kentucky have much higher proportions (22 to 25 percent). Exhibit 4-2 shows the distribution of the aged across states.





Again, Wyoming and Delaware have 8 to 10 percent of enrollees in this category, whereas Alabama and Missouri have 14 to 16 percent. These variations will explain state variation in spending as we will find in multivariate analyses.

#### **4.1 Demographic Distribution of Medicaid Enrollees Across States**

Table 4-2 shows demographic characteristics of Medicaid enrollees across various states. Infants under age one constituted the smallest age category with about 3 to 4 percent of all PYEs. New Jersey and California, two of the largest states, had only about 2.5 percent enrollment in this category. Wyoming had the highest (4.2 percent). Most of the enrollees were either children (aged 1-18) or young adults (aged 19-44). Alabama had slightly more young children (age 1-5) but for most other states, this age group has the smallest number of enrollees among those aged 1-44. There is fairly equal number of enrollees in the older children (aged 6-18) and young adult (aged 19-44) categories, ranging approximately between 25 to 30 percent. We find a higher percentage of very old enrollees (age 75 and above) relative to the young elderly (age 65-74) in all states.

Since differences across states in age distribution should account for variation in drug spending, it is useful to note that some states (e.g., Alabama and Missouri) have a much higher percentage of elderly (age 65 and older) than other states (e.g., Delaware and Wyoming). Children, on the other hand, constitute a higher percentage of enrollees in Delaware and Wyoming relative to other states.

We do not observe any significant variation in gender-mix across states. However, significant race differences exist across states. Alabama, Delaware, Georgia, and New Jersey have a much higher percentage of black enrollees than whites. Hispanics constitute a disproportionate number of enrollees in California (29 percent) and New Jersey (20 percent). Thus, race differences can potentially explain some utilization differences across these states.

Approximately 40 percent of enrollees lived in rural areas in Alabama, Georgia, and Missouri. There were no rural counties in New Jersey. Only 5 percent of the enrollees in California lived in rural counties. Wyoming did not report residence status.

Exhibit 4-3 illustrates the distribution of enrollees by race. States such as Kentucky, Missouri, and Wyoming have predominantly white enrollees, whereas in Alabama, Delaware, and Georgia, more than half of the enrollees are black. Exhibit 4-4 shows the distribution of enrollees by residence and how some states are predominantly urban or rural.



## 5.0 SPENDING AND UTILIZATION OF PRESCRIPTION DRUGS

In this chapter, we discuss prescription drug spending and utilization rates across the eight study states. We first examine the total spending patterns and then examine rates of use by Medicaid eligibility and demographic characteristics.

### 5.1 Medicaid Drug Spending As A Share Of Total Medicaid Spending

Table 5-1 provides a general overview of prescription drug spending in relation to total and outpatient Medicaid spending for the eight study states.<sup>1</sup> Missouri had the highest prescription drug spending as a percentage of total Medicaid spending followed by Alabama and Kentucky. Prescription drug spending as a percentage of total Medicaid spending varied across states, with states such as Wyoming and Delaware spending only 5 to 6 percent while Missouri and Alabama spent 11 to 12 percent. On average, across all eight states, prescription drug spending accounted for 9.7 percent of total Medicaid expenditures.

Missouri and Alabama also had the highest prescription drug spending as a percentage of total outpatient spending at about 28 and 27 percent, respectively. As a percentage of outpatient spending, Delaware and Wyoming spent the least (15 and 12 percent, respectively).

### 5.2 Aggregate Prescription Drug Spending Across Eight States

Table 5-2 reports aggregate enrollees, users, prescriptions, and spending across the eight study states. California had the highest number of enrollees and Wyoming had the lowest.<sup>2</sup> The third and fourth columns report the total number of prescription drug users in each state and the percentage of enrollees who used drugs. The percentage of users ranges from 73 percent in Delaware to 81 percent in Missouri and New Jersey. Differences in user rates across states can be attributable to enrollee-mix (e.g., demographic) differences. Missouri and New Jersey, for example, had higher percentages of elderly compared with Delaware and Wyoming (see Table 4-2).

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<sup>1</sup>Since the MSIS analytic files used for this study did not contain any nor-drug utilization data, HCFA subsequently sent us total spending on Medicaid services using 2082 data. As a result, the spending totals in Table 5-1 are slightly different from 5-2. The difference is attributable in part to the method used to calculate the total (reported claims versus incurred claims) and in part because a small percentage of claims was eliminated in Table 5-2 because there was no associated eligibility data..

<sup>2</sup>These enrollment totals and associated statistics are based on enrollment and claims data for individuals with Medicaid eligibility records. A small percentage of claims records did not have matching eligibility data and those records were dropped.





Medicaid eligibles in California used more than 40 million prescriptions and those in Georgia about 9.5 million. Other than Delaware and Wyoming (two smaller states), enrollees in all other states used 6 to 9 million prescriptions in total. The number of prescriptions per user ranged from a low of only 9.7 in Wyoming to 18.2 in Kentucky. Most states showed at least one prescription used per month by an average user. Standardizing by PYE, rates of use across states change only slightly from rates per user.<sup>3</sup> Kentucky and Missouri used more than 18 prescriptions per PYE. Wyoming used 10.8 prescriptions per PYE as opposed to 9.7 per user.

The last panel of Table 5-2 shows spending; totals and cost per prescription, per user, and per PYE. Prescription costs range from \$20.40 in Georgia to \$27.63 in New Jersey. Per user and per PYE costs are about the same.<sup>4</sup> New Jersey had the highest cost per PYE (\$457.16) and Wyoming had the lowest (\$251.48). California was also a low-cost state (\$279.36). Eligibility and demographic differences would account for much of these differences across states. Wyoming, for example, had a higher percentage of children (56 percent) than New Jersey (48 percent). Wyoming also had a lower percentage of the aged (8.5 percent) than New Jersey (12.2 percent). Aged enrollees are higher utilizers compared to children (see Table 4-1). California had about the same BOE mix as New Jersey but there were racial differences. Hispanics, the lowest user group, constituted nearly 30 percent of PYEs in California but only about 20 percent in New Jersey (see Table 4-2).

Prescription drug spending per PYE (\$/PYE) can be decomposed into (a) prescriptions per user, (RX/U), (b) spending per prescription, (\$/Rx), and (c) users, per PYE (U/PYE), as shown in equation 5.1.

$$\left[ \frac{\$}{\text{PYE}} \right] = \frac{\$}{\text{Rx}} \cdot \frac{\text{Rx}}{\text{U}} \cdot \frac{\text{U}}{\text{PYE}} \quad (5.1)$$

This decomposition allows us to examine the dimensions in which states can vary in terms of spending and utilization. Cost per PYE in New Jersey is higher than in Wyoming partly because use rates are higher in New Jersey (15.56 prescriptions per user in New Jersey versus 9.70 prescription per user in Wyoming). Prescription costs are also higher in New Jersey (\$27.63 versus \$23.37 in Wyoming).

<sup>3</sup>Although PYE and user rates are very similar in the aggregate, it is possible for these rates to diverge for specific sub-populations (e.g., aged categorically needy cash enrollees, or infant enrollees of age less than one).

<sup>4</sup>The method of calculating PYE produces almost equal number of PYEs as users.





Between Georgia and New Jersey, we find a major difference in prescription cost. (An average prescription costs about \$7 more in New Jersey). Prescription use rate (per user) is not very different between Georgia and New Jersey. Thus, differences in PYE cost rates between these two states are primarily due to prescription cost differences. To take another example, Missouri and Kentucky had higher use rates than New Jersey, but because of higher prescription cost, New Jersey had a higher cost per user than those two states.

### **5.3 State Utilization and Spending Rates By Medicaid Eligibility Characteristics**

#### **5.3.1 Utilization**

Table 5-3 shows the number of prescriptions used by various Medicaid eligibility groups in 1992 for the eight states. Rates of use are shown on a person-year equivalent (PYE) scale to adjust for varying lengths of time that a Medicaid eligible was enrolled. Wyoming, Delaware, and California had some of the lowest utilization rates with 10.8, 11.8, and 12.9 prescriptions per PYE, respectively. Kentucky and Missouri had some of the highest rates (18.3 and 18.1 prescriptions per PYE, respectively). Alabama, New Jersey, and Georgia had utilization rates in the intermediate range with Georgia having slightly lower rates (14.1 prescriptions) of use than Alabama and New Jersey (16.6 and 16.5 respectively).

Categorically needy (cash) enrollees – Among the categorically needy cash recipients who constitute the largest group of enrollees in all states, relative utilization patterns across states do differ in some respect from the aggregate. Wyoming had the lowest utilization rate (9 prescriptions) and Alabama the highest (about 19 prescriptions) showing a difference of more than 100 percent. Alabama, which had a moderate utilization rate when all enrollees were considered, has the highest rate of drug use among cash recipients in all states (18.9 prescriptions per PYE). Alabama is followed by Kentucky and New Jersey with 17.5 and 15 prescriptions, respectively. One of the high-use states in the aggregate was Missouri; yet it has one of the lowest rates of use among cash enrollees (only 10.2 prescriptions).

Children were the lowest users in all states. Utilization ranged from a low of 4.1 and 4.7 prescriptions in Alabama and Delaware, respectively, to a high of about 7 prescriptions in New Jersey and California. Aged and blind and disabled enrollees used the most prescriptions. Utilization rates for these groups ranged from a low of about 22 prescriptions for the aged in California and blind and disabled in Wyoming to a high of about 41 prescriptions for the aged in Missouri. Missouri also had the highest rate of use for the blind and disabled (with 37.3 prescriptions per PYE).



Adults used about twice the number of prescriptions as children with California showing the minimum difference (between children and adult use rates) and Alabama and Kentucky showing the most difference (adults used more than two times as many prescriptions as the children).

Categorically needy (non-cash) enrollees -- Among the categorically needy non-cash enrollees, the range of variation in relative utilization across states was more pronounced than the cash enrollees. In Kentucky, the utilization rate was about 48 prescriptions, about nine times more than California (5.4 prescriptions) and more than six times that of Delaware and Georgia (7.6 and 7.3 prescriptions, respectively). Georgia did not report anyone in the aged and blind/disabled non-cash categories. As such, a low use rate for Georgia is not surprising, given that it is based solely on children and adults. The relatively low rate for California is largely driven by the low rate for the aged who used only about 18 prescriptions while all other states (except Delaware) experienced a rate of use in excess of 43 prescriptions. Kentucky, once again, had the highest use rates for the aged and blind/disabled (with about 92 and 75 prescriptions, respectively).

Children and adults were the lowest users for all states. Children used between 4.3 (in California) to 6.7 prescriptions (in Missouri), adults between 4.7 (California) and 10.9 prescriptions (Missouri).

Medically needy enrollees -- Half of the states (California, Georgia, Kentucky, and New Jersey) had medically needy programs, but enrollment was low in Georgia and New Jersey. There were at least 100 PYEs or users only among children in those two states. Children used about 7 prescriptions in New Jersey and 8 in Georgia. This compares with 5.6 and 7 prescriptions, respectively, in Kentucky and California. Enrollees in all categories in Kentucky used more prescriptions than in California. The aged in Kentucky used more than three times the number of prescriptions used by the aged in California (91 versus 28 prescriptions).

Pre-1988 expansion group enrollees -- Other than Alabama and Wyoming, all states reported some enrollees in the pre-1988 expansion category. However, California did not report anyone under the aged and blind/disabled categories. Aged and blind/disabled enrollees in Kentucky used more than twice the number of prescriptions relative to those in the other states who reported enrollment in those BOE categories. For example, the aged in New Jersey used 31.2 prescriptions and those in Missouri used 48.4. The aged in Kentucky, on the other hand, used more than 100 prescriptions.

Adults used fewer prescriptions than children in most states (Kentucky is an exception). Utilization rates for children ranges from a low of 4.1 prescriptions in Georgia to a high of about 10 prescriptions in Missouri. California and New Jersey also had high use rates for





children 3.5 and 8 prescriptions, respectively). Excluding Georgia which had very low adult enrollment, adults used between a low of 3.7 and 3.8 prescriptions in New Jersey and California and a high of 8.4 in Kentucky.

Post-1988 expansion group enrollees – Other than Wyoming, all states reported some enrollees in the post-1988 expansion category. However, only two states (Delaware and Kentucky) reported blind and disabled enrollees in this expansion group. New Jersey did not report anyone in the aged or blind/disabled categories. Except in California, rates of use for the aged are very low for all states reporting enrollees in that category. For example, four of the six states reporting some aged enrollment showed less than 2 prescriptions used. The aged in other MAS categories used 20 to 40, and sometimes as many as 100 prescriptions. Such low use rates for the aged in the post-1988 expansion category should not be surprising since this group predominantly consists of Qualified Medicare Beneficiaries (QMBs). (As noted in section 2.1.2, QMBs are not covered for prescription drugs unless they otherwise qualify for Medicaid). The utilization rate for the aged in California in this MAS group could be higher relative to other states because California reported blind and disabled enrollees in the aged category (as suggested by other researchers).

Children used between 6.2 prescriptions (Kentucky) to 8.3 prescriptions (New Jersey). Adults used between 4.5 prescriptions (Delaware) to about 9 prescriptions in Georgia.

### 5.3.2 Spending

Table 5-4 shows spending per PYE across various Medicaid eligibility groups in 1992 for the eight states. Four of the eight states, including Wyoming (\$251), Delaware (\$281), California (\$279), and Georgia (\$288), were in the low-cost category. The other four states each costing more than \$350 per PYE were Alabama (\$351), Kentucky (\$376), Missouri (\$378), and New Jersey (\$457).

Categorically needy (cash) enrollees – Among the categorically needy cash recipients who constitute the largest group of enrollees in all states, relative utilization patterns across states do differ in some respect from the aggregate. Missouri which has the second highest cost (per PYE) in the aggregate had the lowest cost (per PYE) among the categorically needy cash enrollees across all states. Enrollees in this eligibility group cost only \$191 per PYE while the next lowest state (Wyoming) cost \$224. New Jersey (\$429) remains the highest cost state followed by Alabama (\$418).

Children had the lowest cost in all states. Spending per PYE ranged from a low of about \$65 in Alabama and Delaware to a high of about \$119 in New Jersey. Aged, blind and





disabled enrollees cost the most with the aged costing slightly more than the blind and disabled in only two states (Alabama and Wyoming). In all other states, blind and disabled enrollees cost more than the aged. New Jersey had the highest cost per PYE for the blind and disabled enrollees (\$1,114). This amount is about 20 percent higher than the cost for the aged (\$931). In California, blind and disabled enrollees cost \$748 while the aged cost \$581. Adults cost about two to three times more than children in all states.

Categorically needy (non-cash) enrollees -- Among the categorically needy non-cash enrollees, the range of variation in relative cost across states was more pronounced than the cash enrollees. In Kentucky, cost per PYE was \$870, more than eight times the amount spent by California (\$103) and more than seven times that of Georgia (\$117). Georgia did not report anyone in the aged and blind/disabled categories. As such, a low rate for Georgia is not surprising. The very low rate for California is largely driven by the aged who cost only about \$500 while all other states (except Delaware) which reported aged enrollment cost close to \$1,000 or more. Kentucky, once again, had the highest cost for the aged (\$1,657) and blind/disabled (\$1,556).

Children and adults were the lowest cost groups for all states. Children cost between \$54 (in California) to \$115 (in Missouri), adults between \$80 (California) and \$276 (New Jersey).

Medically needy enrollees -- Children cost \$175 in New Jersey and \$181 in Georgia. These amounts are twice as much as the amounts spent by children in California and Kentucky (\$84). Enrollees in all other categories in Kentucky cost more than in California. The aged in Kentucky cost between two to three times the amount as in California (\$1,701 versus \$633).

Pre-1988 expansion group enrollees -- Aged and blind/disabled enrollees in Kentucky cost nearly twice the amount spent by Delaware and Georgia. Expenditures on the aged in New Jersey was also about half that of Kentucky. Adults cost less than children in most states (Kentucky is an exception). Spending rates for children ranged from a low of \$62 in Georgia to a high of \$177 in Missouri. New Jersey also had high costs for children (\$147). Excluding Georgia which had very low adult enrollment, adults cost between a low of \$52 and \$56 in Delaware and California to a high of \$105 in Kentucky.

Post-1988 expansion group enrollees -- Except in California, costs for the aged are very low for all states reporting enrollees in this category. As noted, this is because QMBs are not covered for drugs. Children cost between \$70 (California) to \$116 (New Jersey). Adults cost between \$79 (Delaware) to \$182 (New Jersey).



## 5.4 State Utilization and Spending Rates by Demographic Characteristics

### 5.4.1 Utilization

Table 5-5 shows the number of prescriptions used by various demographic groups based on age, sex, race, and urbanicity of residence.

#### 5.4.1.1 Utilization by Age

In general, we find that utilization increases with age. Infants under age 1 are often more likely to need prescription drugs than older children, particularly those between ages 6 to age 18. Across all states except Kentucky, children between the ages of 6 to 18 used the least number of prescriptions (in the range of 4 to 6 prescriptions per PYE). Beyond age 18, utilization starts to increase, and for most states reaches a maximum for the very old enrollees (age 75 and above). For this later age group, utilization ranges from 26 prescriptions in California to more than 50 in Kentucky and Missouri. Rate of use for those aged 45-64 was eight times higher than that of infants under age 1 in Kentucky. In California and New Jersey, there was a four-fold difference.

For most states, utilization rates do not change very much between the age group 45-64 and the two elderly age groups (sometimes rates drop a little for the elderly (age 65-74) and then increase a little for the very old). This is consistent with the finding from our earlier tables on Medicaid eligibility that QMBs who are reported in the post-1988 aged expansion group are not covered for prescription drugs.

In Kentucky, Missouri, and Wyoming, elderly enrollees (aged 65-74) used 3 percent to 34 percent more than adults aged 45 to 64. In six of the eight states, the elderly above 75 years of age used 1 percent to 59 percent more drugs than those aged 45 to 64. The two states where elderly use declined were California and Delaware.

#### 5.4.1.2 Utilization By Gender, Race, and Urbanicity

Across all states, females had a higher rate of prescription drug use than males. The highest differential was found in Alabama where the rate for females was 56 percent higher than for males. The lowest was in California with females using only 11 percent more than males. In most states, females used 30 to 40 percent more than males. Other studies have found that females use more prescription drugs than males because of differences in need (Bush *et al.*, 1978; Svarstad *et al.*, 1987).





Another consistent finding is that whites had a higher rate of drug use than blacks and Hispanics. In Missouri and New Jersey, white enrollees used more than twice the number of prescription drugs per PYE than blacks. In all other states except California, whites used drugs at a rate between 70 to 85 percent greater than blacks. California had the narrowest black-white difference (whites used only 17 percent more than blacks). California, however, had a significant Hispanic enrollee population (more than the number of blacks), and white enrollees were found to use prescription drugs at a rate more than twice the number used by Hispanics. New Jersey, another state with a significant number of Hispanic enrollees, also experienced a white utilization rate more than twice the Hispanic rate. In Kentucky, whites used more than three times the amounts used by Hispanics. In all states with Hispanic enrollees, whites used at least 74 percent more than Hispanics.

The patterns of racial differences in use are very pronounced. In future studies, researchers should examine the source of these differences, whether these are driven by health status and other need-based differences or simply an artifact of access barriers facing minority populations.<sup>5</sup>

Four of the five states which reported both rural and major urban enrollees showed 30 to 77 percent higher use rates among rural relative to major urban enrollees. One earlier study (Tudor, *et al.*, 1991) on Georgia found that the rate of drug expenditures in urban areas was higher than in rural areas. In this study, we find that Missouri and Alabama had 50 percent higher use in rural areas relative to major urban areas. Georgia had the highest difference (rural 77 percent higher), and Kentucky, the lowest difference (rural 30 percent higher).

There are several possibilities why utilization in rural areas may be higher than that in urban areas. The demographic mix of enrollees in rural and urban areas may account for some of the difference. In multivariate analyses (Section 5.6), we control for demographic and other differences and found that urban/rural differences are largely attributable to enrollee mix differences.

#### 5.4.2 Spending

Table 5-6 shows spending per PYE for various demographic groups based on age, sex, race, and urbanicity of residence.

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<sup>5</sup>We examined Georgia's black-white differences by age and eligibility characteristics for therapeutic drug classes and found that racial differences still persist.



#### 5.4.2.1 Spending Rates By Age

In general, we find that prescription drug spending increases with age, as expected. For six of the eight states, spending per PYE increases consistently starting with infants under age 1 to adults aged 45 to 64. Infants under age 1 cost as little as \$55 per PYE (Kentucky) and as much as \$107 (New Jersey). In most states, infants under age 1 are the least costly group and adults aged 45-64 is the most costly group. The former group costs as little as 6 percent of the latter group (Kentucky) and no more than 13 percent of the latter group (Georgia). The cost for adults aged 45-64 range from a low of \$728 in California to a high of \$1,218 in New Jersey. The method of calculating PYE produces almost equal number of PYEs as users.

In California and Georgia, costs actually declined slightly from the level for infants under age 1 to the level for children aged 6-18 (from \$96 to \$76 in California, and from \$102 to \$94 in Georgia). For all other states, costs rise through age 45-64 (with the exception of Wyoming where costs peak at the next age bracket, age 65-74) before declining slightly for the elderly. In half of the states, costs further decline for the very old (age 75 and above) compared with the level for those aged 65-74.

#### 5.4.2.2 Spending Rates By Gender, Race, and Urbanicity

Across all states, drug expenditures for females were higher than for males. The highest differential was found in Alabama where the rate of expenditures for females was 52 percent higher than for males. The lowest differential was in California where the rate for females was only 3 percent more than for males. In most states, the rate of drug expenditures for females was 20 to 30 percent more than for males.

Another consistent finding is that drug expenditures for white enrollees were higher than for black and Hispanic enrollees. In Missouri and New Jersey, white enrollees incur drug costs at a rate more than twice that of blacks. In all other states except California, the rate for whites were between 70 to 90 percent higher than for blacks. In California, the rates for white enrollees were 42 percent higher than for black enrollees. In California, which has a significant Hispanic enrollee population, the rate for whites was 3.7 times more than for Hispanics. New Jersey, another state with a significant number of Hispanic enrollees, shows a 2.7 times higher rate for whites relative to Hispanics. In Kentucky, whites incur costs more than four times the rate for Hispanics. In all states with Hispanic enrollees, whites incur costs at least twice that of Hispanics. Thus, the patterns of racial differences are very pronounced in the use and cost of





prescription drugs. More research needs to be done to examine the sources of these differences.

Four of the five states reporting enrollees by type of county of residence showed 35 to 77 percent higher rates of drug expenditures among rural relative to major urban enrollees. These states include Alabama, Georgia, Kentucky, and Missouri. As noted earlier, demographic mix of enrollees and other differences in health status as well as practice pattern variations may account for some of the difference.

## **5.5 Medicaid Eligibility Duration and Its Effects On Utilization and Spending**

### **5.5.1 Distribution of PYEs By Duration and Continuity of Enrollment**

Table 5-7 shows prescription drug utilization and spending across full-year and part-year enrollees and for those with multiple enrollment periods. The second line gives the distribution of PYEs across these enrollment groups. Except Wyoming, between 60 to 65 percent of PYEs were enrolled for the full year (1992). Part-year continuous enrollees (those with only one period of eligibility during 1992) constituted another 25 to 46 percent of PYEs. Most states had about one out of three PYEs enrolled as part-year. Alabama had one out of four PYEs in part-year and a relatively higher percentage of PYEs (compared to other states) who had more than one period of enrollment (14 percent).

### **5.5.2 Utilization By Duration and Continuity**

Full-year enrollees consistently used more prescriptions than part-year and discontinuous (multi-period) enrollees. Discontinuous enrollees also consistently used more than part-year enrollees. Full-year enrollees used between 15 to 23 prescriptions per PYE. Part-year enrollees used between 6 to 10 prescriptions per PYE. Thus, use rates for part-year enrollees was only around 40 percent of the use rates for full-year enrollees in most states even though the numbers were standardized on a full person-year scale for both groups of enrollees.

States, however, varied in terms of part-year and full-year use differences. For example, part-year enrollees in Alabama only used about 26 percent of the number used by full-year enrollees. On the other hand, part-year enrollees in New Jersey and Wyoming used about 48 percent of the number used by full-year enrollees. For all other states, part-year use rate was around 40 percent of the full-year use rate.

Discontinuous enrollees with more than one period of enrollment used slightly more prescriptions than part-year but less than full-year enrollees. Discontinuous enrollees used





between 45 percent (Delaware) to 82 percent (Missouri) of the number used by the full-year enrollees. For most states, discontinuous enrollees used between 50 to 60 percent of the number of prescriptions used by full-year enrollees.

### 5.5.3 Spending By Duration and Continuity

Full-year enrollees consistently incur higher prescription costs than part-year and discontinuous (multi-period) enrollees. Similarly, discontinuous enrollees consistently incur higher costs than part-year enrollees. New Jersey had the highest expenditure rate among full-year enrollees (\$565 per PYE), more than twice that for part-year enrollees in that state (\$247 per PYE). Alabama, Kentucky, and Missouri also had very high costs among full-year enrollees (\$475-\$490). For Alabama, part-year enrollees cost only \$111, for Kentucky \$155, and for Missouri, \$182. Cost for part-year enrollees was only around 30 to 40 percent of the cost for full-year enrollees in most states.

Drug expenditures for enrollees with more than one period of enrollment varied across states ranging from only \$126 in Delaware to \$448 in Missouri. Relative to the cost for full-year enrollees, these costs were about half in most states. Missouri is an exception where full-year and discontinuous enrollees incur about the same costs. Delaware is another exception where discontinuous enrollees incur costs only 32 percent of that for the full-year enrollees.

One reason for the variation in rates of use and cost between part-year and full-year enrollees is eligibility differences. In state-by-state analyses (Volume II), we examine variation in cost and use by both demographic characteristics and enrollment duration.

## 5.6 Multivariate Analysis of Drug Use and Spending

In our descriptive analyses, we found considerable variation in drug use and spending across demographic and enrollment groups and across states. Many of these differences could be confounded with each other. For example, a difference in utilization between urban and rural areas could be attributable to the demographic mix of enrollees living in these areas. Similarly, use rates could differ across areas because of enrollee mix differences as well as area-specific factors affecting demand for prescription drugs. In order to examine the effect of each of the various analytic characteristics used in the descriptive analysis, we conducted a county-level multivariate regression. For example, controlling for age, gender, and race composition, we can determine if spending in urban areas is higher or lower than spending in rural areas. The regression model estimates the effects of area-level aggregate Medicaid population



characteristics (e.g., proportions of blind and disabled enrollees, blacks, females, and enrollees in various age groups) and health care supply factors (e.g., physician density and availability of hospital beds) on Medicaid prescription drugs cost and utilization rates.

Variables representing general health status and need for drugs (such as age, gender, race, and blind and disabled status), as well as variables representing area-wide demand for and price of drugs (such as urbanicity, Medicaid enrollees as a share of area population, hospital and physician supply, population density, and average income) were used in the regression. Theory predicts that *ceteris paribus*, areas with more older age people will have higher drug expenditures due to higher levels of utilization. A higher proportion of blind and disabled enrollees may also lead to higher expenditures since enrollees in this BOE category need more drugs. Areas with more medically needy enrollees may also have higher expenditures. Urban areas may have higher expenditures because of higher demand for drugs and easy access. Similarly, areas with more physicians may have higher drug utilization because of more prescriptions written and more patients seen by the doctors. Areas with lower per-capita income may have higher expenditures per capita if relatively more Medicaid enrollees needing drugs live in those areas, and there are better access and more pharmacies in those areas.

Using descriptive analyses, we found that states vary considerably in terms of cost and utilization rates. For example, New Jersey had nearly 64 percent higher costs per PYE compared to California (\$457 vs. \$279). One reason why drug costs varied between states is that states varied considerably in terms of average demographic and eligibility characteristics. For example, Missouri had only 15 percent of PYEs in the blind and disabled category (a high cost group), while about 25 percent of Alabama's PYEs were in the blind and disabled category. In making adjusted comparisons using multivariate regression, we will be controlling for these demographic differences. Adjusted differences in expenditure and utilization rates across states will increase or decrease depending on how states differed in terms of demographic and other variables explaining utilization and cost.

### 5.6.1 Model Specification and Variables

We used three dependent variables, (1) Medicaid spending on prescription drugs per PYE, (2) utilization (number of prescriptions) per PYE, and (3) spending per prescription. Each model included the same set of independent variables presented with their weighted (by the county Medicaid population) mean values in Table 5-8. We also included dummy variables for





each state in the analysis<sup>6</sup>. We used Delaware as the omitted state although any state could be used as the omitted category. (Delaware did not have any of the four major drug reimbursement policies).

On average, across all counties in the seven study states, Medicaid enrollees between the ages of 6 to 18 constituted about 24 percent of all PYEs (see Table 5-8). Children below age 6 were the omitted category. About 28 percent of PYEs were between the ages of 19 and 44, only about 9 percent between age 45 and age 64, about 7 percent between age 65 and age 74, and 9 percent above age 75. Blind and disabled enrollees constituted 18 percent of all PYEs. Nearly 63 percent of enrollees were female, 25 percent were black, and there were very few other non-whites. Whites constituted the omitted race group in the regression.

Among the Medicaid enrollment variables, there were 69 percent cash enrollees, about 10 percent medically needy enrollees, and close to 8 percent in the post-1988 expansion group. Non-cash categorically needy enrollees were omitted.

Medicaid PYEs accounted for about 12 percent of the county population. Major urban residents constituted 54 percent of all Medicaid PYEs. Minor urban residents constituted another 27 percent. Rural residents constituted the omitted category. Several other area variables were extracted from the Area Resource File. These included the number of primary care physicians (general and family practice), hospital beds, hospital admissions, population density, and per capita income. The numbers of physicians, hospital beds and admissions were expressed per thousand people living in the county. On average, there was only one physician for every 4,000 people, and close to 4.7 hospital beds and 137 admissions for every 1,000 people. Population density was 14.8 people per square mile. Weighted mean county per capita income \$18,533 (unweighted mean was only \$14,376).

To adjust for the size of the county in terms of Medicaid population, the model was estimated using weighted least squares with total Medicaid enrollment (total PYEs) in the county as the weighting variable (see Appendix A for more detail).

## **5.6.2 Effects of Enrollment, Demographic, and Area Characteristics on Medicaid Drug Use and Costs**

Table 5-9 presents the regression coefficients and associated standard errors, and significance testing for the county level regressions explaining Medicaid drug use and spending. Across the three models, R-squares (explained variation) ranged from 79 to 87 percent. Such high R-squares should not be surprising given that we are working with

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<sup>6</sup> We had to exclude Wyoming from the county analysis because it had missing values for several of the independent variables. Wyoming is also the smallest state.



grouped data (Maddala, 1977, page 269). Significant variables included state dummy variables representing policy and other unmeasured differences across states, demographic variables including age, gender, and race composition of the county Medicaid population, urbanicity status, Medicaid enrollment (MAS) status, and other area-specific variables.

### **State Level Differences in Costs per PYE**

Controlling for demographic and other factors, we find significant differences across states in drug use and cost. California and Alabama are the two lowest cost states with spending per PYE which is lower than Delaware (the omitted state) by \$132 to \$111, respectively (47 and 40 percent lower than Delaware's cost). On the contrary, New Jersey had the highest cost among all states (\$126 per PYE or 45 percent higher than Delaware's cost). Although the coefficients reported are all relative to Delaware, one can also compare coefficients across states. Thus, controlling for other factors, cost per PYE in New Jersey was about \$258 higher than California. Without any adjustment, New Jersey's cost was about \$178 higher than California. Thus, multivariate adjustments increased the difference in cost between these two states. As reported earlier (Tables 4-1 and 4-2), New Jersey had fewer white enrollees relative to California (32% vs. 36%), a lower percentage of medically needy enrollees (0.5% vs. 16%), and fewer enrollees in major urban areas relative to California (59% vs. 77%). These are some of the factors which accounted for the increase in New Jersey's cost (relative to California's) once we control for these differences.

Among other notable differences between states based on our descriptive analyses, we found that Delaware had only 6 percent of enrollees (PYEs) between the ages of 45 and 64. Kentucky, on the other hand, had more than 10 percent of PYEs in that age category. As shown in Table 5-9, a one percent increase in PYEs in this age group leads to a significant increase of \$13 in spending per PYE. Thus, this factor will reduce Kentucky's cost relative to Delaware's once we control for the percentage of PYEs in this age group. (The unadjusted cost per PYE in Kentucky was \$95 higher than Delaware; adjusted cost in Kentucky was \$67 lower).

Consider the percentage of blind and disabled enrollees. Missouri had only 15 percent of PYEs in this category. In Alabama, on the other hand, about 25 percent of PYEs were blind and disabled. Based on our regression, we find that a one percentage increase in the blind and disabled enrollees increases cost per PYE by \$5.60. Controlling for the proportion of enrollees in this category, we should find costs in Missouri relative to Alabama to increase. Without adjustment, Missouri's cost per PYE was \$26 higher than Alabama's. The adjusted difference is about \$134.





The rankings of states in terms of high to low spending per PYE with and without multivariate adjustment are shown below.<sup>7</sup> Delaware became a higher cost state after adjustment because its lower unadjusted cost is explained in large part by a lower proportion of high-cost enrollees between the ages of 45 and 64 and a higher percentage of low-cost black enrollees. Kentucky has moved down in cost ranking because of higher proportions of enrollees in high-cost age and race groups. Alabama has moved down once adjusted for its higher proportion of blind and disabled enrollees. Georgia, which had the highest percentage of black enrollees among all states, moved up.

#### RANKING OF STATES BASED ON COST PER PYE

<u>Without Adjustment</u>	<u>With Adjustment</u>
New Jersey (\$457.16)	New Jersey
Missouri (\$377.66)	Missouri
Kentucky (\$376.44)	Delaware
Alabama (\$351.31)	Kentucky
Georgia (\$288.05)	Georgia
Delaware (\$281.02)	Alabama
California (\$279.36)	California

#### State Level Differences in Prescriptions per PYE and Costs per Prescription

Only three states (California, Missouri, and New Jersey) exhibited significantly different utilization rates relative to Delaware (Table 5-9). Prescription use rates were the lowest in California which used 3.6 prescriptions (31 percent) less than Delaware. Without any adjustment, Delaware was the lowest utilizer state (among the seven states used in regression) followed by California. Multivariate adjustments increased Delaware's utilization rate relative to California. Compared to California, Delaware had a lower percentage of high-cost enrollees (aged 45-64), a higher percentage of low-cost black enrollees, and a higher percentage of post-1988 enrollees (who were predominantly QMBs and used fewer prescriptions).

Missouri and New Jersey had the highest utilization rates. New Jersey used 3.3 prescriptions (28 percent) more than Delaware. Missouri used 2.6 prescriptions more than Delaware. Multivariate adjustments also increased the difference in use rates between California and New Jersey. Without adjustment, New Jersey used 3.7 prescriptions (29

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<sup>7</sup> Delaware was used as the base (omitted) state because that is the only state without major cost containment policies related to Medicaid prescription drug reimbursement.





percent) more than California. With adjustment, New Jersey used 6.8 prescriptions more than California.

Unadjusted and adjusted rankings in terms of high to low utilization are shown below. With adjustment, New Jersey and Delaware both moved up, and Alabama and Kentucky both moved down in ranking. Their relative positions have changed because states were not comparable before the adjustment.

**RANKING OF STATES BASED ON PRESCRIPTIONS PER PYE**

<u>Without Adjustment</u>	<u>With Adjustment</u>
Kentucky (18.32)	New Jersey
Missouri (18.09)	Missouri
Alabama (16.57)	Kentucky
New Jersey ( 16.54)	Georgia
Georgia (14.11)	Delaware
California (12.87)	Alabama
Delaware (11.82)	California

Although Georgia, Kentucky, and Alabama were not significantly different from Delaware in terms of the number of prescriptions used per PYE, these three states had significantly different costs per PYE (Table 5-9). PYE cost differences were driven by differences in cost per prescription as shown in the last column. Missouri, which had significantly higher prescription use relative to Delaware, had a lower cost per prescription. Nevertheless, Missouri's higher use rate dominated the lower prescription cost, and hence, cost per PYE was still higher in Missouri relative to Delaware. All three states (Alabama, Georgia, and Kentucky) had significantly lower (\$6 to \$7 lower) prescription costs relative to Delaware.

All states except New Jersey had a lower cost per prescription compared with Delaware. New Jersey is nearest to Delaware geographically, and hence, it is not surprising that Delaware ranks next to New Jersey in terms of cost per prescription.

Unadjusted and adjusted rankings in terms of high to low costs per prescription are shown below. Missouri and Georgia moved up, and Alabama and Kentucky moved down in ranking once states were made comparable in terms of enrollee characteristics.



## RANKING OF STATES BASED ON COST PER PRESCRIPTION

<u>Without adjustment</u>	<u>With adjustment</u>
New Jersey (\$27.64)	New Jersey
Delaware (\$23.78)	<i>Delaware</i>
California (\$21.71)	Missouri
Alabama (\$21.20)	California
Missouri (\$20.88)	Georgia
Kentucky (\$20.55)	Alabama
Georgia (\$20.42)	Kentucky

### Demographic Differences

Table 5-9 reports how spending and use rates vary by the enrollee mixes in terms of demographic and other characteristics. We find that relative to children under 6 years of age, all other age categories spent more per PYE. Those aged 45 to 64, and 75 and above used more prescriptions relative to children under age 6. Cost per prescription was higher for the elderly (aged 65 and above) and also for those aged 19 to 44. These patterns are very similar to what we found in descriptive analysis.

Blind and disabled enrollees tend to use more drugs and spend more on drugs. Female enrollees also use and spend more than male enrollees with more significant differences in cost per prescription. Black Medicaid enrollees spend less than white enrollees. The black-white difference is not significant in terms of utilization rate. In our descriptive analysis, we found that blacks used fewer prescriptions than whites. Although multivariate adjustment eliminates this difference, we feel that this finding should be used with caution. Using univariate statistics, we found that many counties had very few (or no) black enrollees. This can pull the estimate down towards zero. Moreover, the weighted regressions assign more weights to counties with a bigger population, and hence California gets more weight than other states. California had the lowest black-white difference among all states. (See Appendix A for more details on some of the limitations in terms of person-level inferences based on aggregate models).

Other race categories (which include a large number of unknown race) has significantly higher use and cost rates. This result is consistent with descriptive findings. Without any knowledge about the composition of this group, it is difficult to infer anything meaningful.

Relative to rural areas, both major and minor urban areas show higher drug use and spending per PYE. In descriptive analyses, we found that in some states (Georgia, Alabama,





Kentucky, and Missouri), rural utilization rates were higher than urban areas. However, California (which dominates the regression results) showed a higher use rate in the urban area. New Jersey did not report any rural areas at all. When all states are combined and other factors are controlled for, we find a higher use rate in urban areas. Average cost of prescriptions, however, was not significantly different across areas.

### **Differences Due to MAS**

Table 5-9 also reports the regression coefficients associated with Medicaid enrollment characteristics. Controlling for all other factors, Medicaid enrollees under the cash assistance program used fewer drugs and cost less per PYE (relative to non-cash categorically needy enrollees). Prescription cost, however, was higher among cash enrollees. It is difficult to compare these findings with the descriptive results presented earlier in this chapter because states differed in ways they classified enrollees into various MAS-BOE categories.

A higher percentage of medically needy enrollees leads to higher cost per PYE because of higher drug prices. Both medically needy and the post-1988 expansion enrollees used fewer drugs relative to the non-cash categorically needy enrollees, but had higher drug prices. The post-1988 group includes the Qualified Medicare Beneficiaries (QMBs) many of whom are not covered for prescription drugs. This may explain the lower rates of use for the post-1988 group. Among those who used drugs, cost of drugs was significantly higher. Many counties did not have medically needy enrollment, and this may make the coefficient on that particular variable sensitive.

### **Area-Specific Differences**

Using a measure of physician density in terms of general and family practitioners per capita, we found that areas with more physicians had higher use and spending rates. Average cost per prescription, however, was significantly lower in those areas. It is likely that these physicians prescribe lower cost drugs but prescribe more of those per patient.

More hospital beds are associated with lower rates of ambulatory drug use and spending. This may be due to more inpatient and less outpatient drug use. Areas with more hospital admissions, however, do not show lower ambulatory Medicaid drug use and spending. More hospital beds may simply imply lower cost of additional day in the hospital, and thus, areas with longer average length of inpatient stay (rather than more inpatient admissions) may be associated with lower outpatient drug use. (It is not possible to test this hypothesis without data on average length of hospital stay).



Population density has a negative effect on use and spending per PYE, but cost per prescription is higher in high-density areas. Since we have already controlled for urbanicity, the population density measure may simply imply variation within urban and rural areas, and some of the left-out variables including health status may explain why use rates are lower in more populated areas. We also find that areas with lower per capita income spend more on Medicaid prescription drugs (per PYE), and vice versa. More Medicaid enrollees are likely to reside in low income areas, and they may enjoy better access to drugs than those living in high income areas.

### 5.6.3 Implications for Policy

As we have seen, states vary substantially in terms of prescription drug use and spending rates even after controlling for Medicaid enrollment and demographic characteristics and other area variables. One source of such variation is the state's prescription drug payment policies. We considered four major policy variables. These are the use of patient copayments, limits in terms of the number of prescriptions, mandatory generic substitution, and prior authorization requirements. As of 1992, our study states had the following distribution of these policies.

TABLE 5-10  
POLICY DIFFERENCES ACROSS STATES

<u>State</u>	<u>Patient Copay</u>	<u>Prescription Limits</u>	<u>Generic Substitution</u>	<u>Prior Authorization</u>
Alabama	yes	no	no	no
California	yes	yes	yes	yes
Delaware	no	no	no	no
Georgia	yes	yes	no	yes
Kentucky	no	no	no	yes
Missouri	yes	no	no	no
New Jersey	no	no	yes	yes

California had all four policies and Delaware had none. Alabama and Missouri had only one policy (copay), and Kentucky and New Jersey had two policies (generic substitution





and prior authorization). Georgia had three of the four policies (without generic substitution). Given this distribution, California can be thought of as the most restrictive (policy-wise) and Delaware the least restrictive of these seven states. As for other states, it is not possible to rank without knowing the relative strength of various policies.

Patient copays, prescription limits, and prior authorization are expected to reduce the use of drugs by eliminating the unnecessary use of drugs at the margin, if administered properly. Generic substitution, on the other hand, is expected to reduce the price of a prescription, and should not affect the use rates.

Unfortunately, with the above distribution of policies, it is not possible to uniquely determine the effect of each of the four policies even if we assume that all other factors affecting state differences are controlled through the regression (a very strong assumption). We tried alternative specifications where we included the policy variables and dropped the state dummy variables. Unfortunately, the model yields unstable policy estimates for the reason mentioned above.

Since state dummies were dropped, the policy variables potentially pick up some of the state effects. This is not a problem as long as there are as many states as unique policy combinations. But with seven states, four policy variables, and the combination of policies as shown in Table 5-10, it is not possible to uniquely identify each policy impact. Moreover, there may be other factors (in addition to policy differences and the factors controlled through regression) which may explain state differences. Thus, Alabama and Missouri, both of which have only copay, may have differences which are not controlled through the regression. Similarly, Kentucky and New Jersey, which have two of the same policies, can also have their unique state effects. When we tried to include both state and policy variables, the model failed due to perfect collinearity. [In general, since the multivariate model is estimated at the county level, it is difficult to assign causality between the dependent variables (cost and utilization) and the independent variables. This is a general limitation of area variation studies.]

Despite the modeling difficulties, we believe that some conclusions regarding policies can be drawn from the regression results with state dummy variables. California, which had all four policies in place, had the lowest cost and utilization rates, and this suggests that at least some of the policies were working in California (in reducing cost and use). New Jersey, the state with the highest cost and use, had only two policies, generic substitution and prior authorization. It is difficult to assess the strength of these two policies since states can vary in terms of the nature of drugs covered by prior authorization and the conditions under which generic substitution are warranted. Their implementations can also vary. New Jersey has very high drug costs in general, and it is difficult to determine if it is due to the policies chosen by





this state or that the policies were chosen to reduce drug costs. We do not have a pre-post experimental control group design to evaluate a policy. Using one year, cross-sectional data, we may erroneously assign policy effects based on baseline state differences.

Other studies have shown that prescription limits can reduce drug use and drug cost, although costs of other health care services can increase as a result of lower drug use (Soumerai *et al.*, 1991). Our analysis also suggests that prescription limits may in fact lower drug use and drug cost.

Although some studies have shown that patient copays can reduce spending, other studies did not always support this (Liebowitz *et al.*, 1985; Harris *et al.*, 1990; Nelson *et al.*, 1984; Reeder and Nelson, 1985). We do not find any evidence that copayments lower costs, although due to design limitations, we were not able to estimate the precise effects. Results on prior authorization, we believe, are dominated by high utilization and cost rates of New Jersey. This should not be construed as the policy effect but rather as a limitation in the study design.



## **6.0 SPENDING AND UTILIZATION ACROSS THERAPEUTIC CATEGORIES: ALL STATES**

Utilization of prescription drugs followed similar and expected patterns across the eight states. In general, we found that therapeutic drug categories were used as expected by eligibility status and demographic characteristics. For example, among aged beneficiaries in most states (regardless of MAS), psychoactives and drugs used to treat cardiovascular conditions (hypotensives, calcium antagonists) and drugs which act on the kidney were found among those drug categories accounting for the top 50 percent of drugs utilized by this group. The blind and disabled tended to use similar drugs. Drug categories appropriate to age, gender, and race/ethnicity also appeared to parallel the medical conditions found in these demographic subgroups. These findings suggest that the Medicaid drug data are generally consistent with expectations of morbidity and drug use.

### **6.1 Utilization and Spending on Most Common Medicaid Prescription Drugs**

A brief description of the clinical uses of the top 50 percent use and spending drug categories is warranted. Table 6-1 summarizes the 14 therapeutic drug categories which represented the top 50 percent of prescription drug utilization and/or expenditures in the eight analyzed states. The definition and use of many therapeutic drug categories, such as the antibiotics, psychoactives, analgesics, anticonvulsants, hypoglycemics, and hypotensives, are self-explanatory. Drugs which act on the kidney and urinary tract primarily include the diuretics. Drugs which act on the joints include those used to treat gout (e.g., colchicine) and arthritis (e.g., anti-inflammatory agents). A variety of topical preparations, including antibacterials and anesthetics, comprise the drug class denoted as Act on Skin. The calcium antagonists include the calcium channel blockers, a drug class used to treat hypertension, angina, and other cardiovascular conditions. The adrenergic class of drugs include beta-blockers and sympathomimetic agents used to treat hypertension and cardiovascular conditions. Cardiac stimulants include digoxin and other digitalis compounds, inotropic agents, and bronchodilators. Drugs which act on the trachea and bronchi include mucolytics, expectorants, and cough and cold diagnostics. Finally, the antihistamine/serotonin drugs is an eclectic category which includes the histamine (H<sub>2</sub>) inhibitors (used to treat ulcer disease), immunosuppressives, steroids used to treat asthma (e.g., chromolyn), and other immunomodulators and enzyme inhibitors.

Tables 6-2 and 6-3 compare the drug categories in the top 50 percent of drug utilization





and expenditures of each of the eight study states. As these tables illustrate, there is considerable variation in therapeutic drug category ranking by state. The possible reasons underpinning these variations will be addressed in the following sections.

A detailed look at the utilization and spending of therapeutic categories is provided in this section. For purposes of parsimony and efficiency, seven therapeutic categories are examined:

- Psychoactives
- Antibiotics
- Drugs Which Act on Joints
- Calcium Antagonists
- Antihistamine/Serotonin Drugs
- Analgesics
- Hypotensives

These seven categories were chosen because they represented the drug categories with the highest utilization and/or spending.

Antibiotics -- The antibiotic category of drugs was ranked first or second in utilization and/or spending for nearly all states (antibiotics ranked fifth in expenditures in California, although ranked the lowest in utilization) (Table 6-4). Kentucky had the highest average antibiotic utilization per PYE enrollee and per user (2.34 prescriptions/PYE enrollee and 3.14 prescriptions/user). California had the lowest per PYE utilization rate (1.52 prescriptions/PYE enrollee), and Wyoming had the lowest per user utilization (2.29 prescriptions/user). The highest average expenditures for antibiotics were in New Jersey (\$45.35 per PYE enrollee and \$66.08 prescriptions/user). California's expenditures were well below the rest of the states, with per PYE enrollee and per user antibiotic expenditures of \$19.42 and \$30.69, respectively. Expenditures per prescription ranged from \$12.76/prescription (California) to \$25.82/prescription (New Jersey).

In general, New Jersey appears to have the highest antibiotic expenditures. Kentucky has high utilization, but expenditures are lower than other states. This finding may be related to Kentucky's prior authorization program for antibiotics. In relation to the use of antibiotics among the eight states, California has the lowest average antibiotic utilization and expenditure rates, which may be due to California's formulary system (which covers some antibiotics) and its mandatory generic substitution provisions.

Psychoactives -- The psychoactives are consistently one of the top 50 percent used drug categories, as well as one of the top budget items for all eight states (Table 6-5). Psychoactive drugs were ranked first or second in utilization and spending for most states. Missouri had the highest average per PYE enrollee and per user utilization (2.30 prescriptions/PYE enrollee and



8.61 prescriptions/user). California had the lowest per PYE enrollee utilization rate (1.10 prescriptions/PYE enrollee), and Georgia had the lowest per user utilization (4.95 prescriptions/user). The highest average per PYE enrollee and per user expenditures for psychoactives was in New Jersey (\$53.96/PYE enrollee and \$196.15/user). California had the lowest per PYE enrollee expenditures (\$23.87), and Georgia had the lowest average per user expenditures (\$85.89/user). Expenditures per prescription ranged from \$16.90/prescription (Alabama) to \$25.91/prescription (New Jersey).

Missouri and New Jersey had the highest psychoactive expenditures rates. This may be due to a general lack of cost-containment policies in place in these two states. Alternatively, such findings may be due to differences in patient mix; i.e., mental illness, and/or the diagnosis of mental illness, in these two states may be higher than in other study states. California and Georgia exhibited the lowest utilization and expenditures rates. These findings may be due to lower incidence of mental illness requiring the use of psychoactives and/or the presence of cost-containment policies, including prior authorization and prescription limits, which decrease demand for covered drugs.

Drugs that Act on Joints – In general, drugs that act on joints were ranked near the bottom of the top 50 percent of utilization and spending of most commonly used drugs (Table 6-6). Alabama had the highest average per PYE utilization (0.84 prescriptions/PYE enrollee and Kentucky had the highest per user utilization rates (3.55 prescriptions/user). Wyoming had the lowest per PYE enrollee and one of the lowest per user utilization rates (0.41 and 2.51, respectively). Alabama also had the highest per PYE expenditures (\$28.55/PYE enrollee), whereas California had the highest per user expenditures (\$134.29/user). Georgia had the lowest per PYE enrollee and per user expenditures (\$10.66 and \$45.02, respectively). Per prescription expenditures ranged from \$17.06/prescription (Georgia) to \$39.43/prescription (California).

In regard to the use of and spending on joint drugs, Georgia has the lowest rates. This finding may be due to Georgia's prior authorization program which covers non-steroidal anti-inflammatory agents and its mandatory generic substitution policy, as many non-steroidal drug alternatives are available generically.

Calcium Antagonists – As Table 6-7 illustrates, utilization of the calcium antagonists was quite low and did not even make the top 50 percent in most states. However, because this class of drugs tends to be expensive, calcium antagonists were ranked in the top 50 percent of expenditures in all states except Wyoming. Alabama had the highest per PYE enrollee expenditures (\$25.50/PYE enrollee) and New Jersey had the highest per user expenditures (\$317.00/user). Delaware had the lowest per PYE enrollee spending (\$16.54/PYE enrollee),





and Alabama had the lowest per user expenditures (\$275.72/user). Per prescription expenditures ranged from \$40.92/prescription (Alabama) to \$53.41/prescription (New Jersey). It is not evident why Alabama, which has the highest per PYE expenditures, has the lowest per user expenditures.

Antihistamine/Serotonin Drugs – The antihistamine/serotonin drugs demonstrated moderate use but high expenditures (Table 6-8). This class of drugs includes the H2-antihistamine inhibitors, a therapeutic category widely used to treat ulcer disease. Kentucky had the highest per PYE enrollee and per user utilization (1.39 prescription/PYE enrollee and 3.88 prescriptions/user). Georgia had the lowest per PYE enrollee and per user utilization although this drug category did not make it into the top 50 percent most commonly used drugs (0.44 prescriptions/PYE enrollee and 2.23 prescriptions/user). Georgia also had the lowest per PYE enrollee and per user expenditures (\$16.88 and \$86.24, respectively), while Kentucky had the highest per PYE enrollee expenditures (\$52.06/PYE enrollee) and New Jersey had the highest per user expenditures (\$197.22/user). Expenditures per prescription ranged from \$37.50/prescription (Kentucky) to \$59.51/prescription (New Jersey).

Analgesics – As summarized in Table 6-9, analgesics are often used in the top 50 percent of drug categories but not a significant budget drug category. Kentucky had the highest per PYE enrollee and per user utilization rates (1.32 prescriptions/PYE enrollee and 4.95 prescriptions/user), whereas Wyoming had the lowest utilization rate (0.60 prescriptions/PYE enrollee and 2.68 prescriptions/user).

Hypotensives – Hypotensives are costly drugs that only made to the top 50 percent of most commonly used drugs in two states (Alabama and Georgia) (Table 6-10). Alabama had the highest expenditures per PYE enrollee (\$21.48) and New Jersey had the highest per user expenditures (\$228.12). Wyoming had the lowest per PYE enrollee expenditure (\$9.38/PYE enrollee) and Alabama had the lowest per user expenditures (\$193.83/user). Per prescription expenditures ranged from \$26.04/prescription (Alabama) to \$38.26/prescription (California).

## **6.2 Utilization of Most Common Medicaid Prescription Drugs by Medicaid Eligibility Category**

The following analysis examines prescription drug utilization for selected therapeutic categories by MAS/BOE across the eight states. For the overall therapeutic analyses, only utilization per PYE enrollee is used. Utilization is insensitive to local differences in drug prices and reflects true consumption differences while PYE counts account for variations in Medicaid duration. Section 6.3 examines drug utilization by demographic characteristics across the eight





states. The three therapeutic categories examined are antibiotics, psychoactives, and analgesics. They were chosen because they represented the three most commonly used therapeutic categories across the eight study states. Similarities across the eight states are noted, as are differences. Speculation for marked state differences is provided in the text as well as in the following chapter examining the role of Medicaid drug reimbursement and cost-containment policies in prescription drug utilization and expenditures.

Antibiotics – As shown in Table 6-11, Kentucky appears to have the highest per PYE utilization rates compared to other states and across all eligibility groups. These rates are notably higher, especially relative to those seen in California, which has among the lowest per PYE utilization rates. The exception is the adult pre-1988 expansion eligibility group in Georgia, which had the highest per PYE utilization (5.45 antibiotic prescriptions/PYE enrollee). Kentucky children in the post-1988 expansion group had the second highest per PYE enrollee utilization rate (3.19 prescriptions/PYE enrollee), in spite of having a prior authorization program which includes antibiotics.

Psychoactives – In Table 6-12, Kentucky again has the highest per PYE enrollee utilization rates. The categorically needy - non cash blind and disabled group in this state used an average of 15.54 psychoactive prescriptions/PYE enrollee. Other high-using eligibility groups in Kentucky were the medically needy aged, the pre-1988 expansion group aged, and the pre-1988 expansion group blind and disabled. No other state had an average of 10 or more psychoactive prescriptions/PYE enrollee. Kentucky has a prior authorization plan for tranquilizers and CNS stimulants/anorectics, which are included in the psychoactive therapeutic category.

Analgesics – Less variation is seen between states in analgesic utilization than was seen with antibiotics and psychoactives (Table 6-13). Once again, Kentucky had the highest per PYE enrollee utilization rates, relative to other states, for all three eligibility groups – categorically needy - non cash, medically needy, and pre-1988 expansion group enrollees. These rates were up to 4 times greater than the utilization rates of the other states.

### **6.3 Utilization of Most Common Medicaid Prescription Drugs by Demographic Characteristic**

Antibiotics – Antibiotic utilization rates by demographic characteristic across the eight study states generally followed expected patterns (Table 6-14). As age increased, antibiotic use decreased, with utilization rates highest in children aged 1-5. There were no apparent gender differences. White and Hispanic per PYE utilization rates were higher than those of blacks.



Rural per PYE utilization rates were slightly higher than urban and other urban rates. In general, the states had fairly consistent per PYE utilization rates, with the exception of Kentucky, which demonstrated slightly higher utilization.

Psychoactives – Psychoactive per PYE utilization rates increased as age increased, peaking at the 45 - 64 age range (Table 6-15). Female per PYE utilization was greater than male utilization. White per PYE utilization exceeded black use by up to a factor of four; black utilization was greater than Hispanic utilization. Rural psychoactive per PYE utilization was slightly higher than in urban and other urban utilization rates. In general, there was little inter-state variation, with the exception of California and Wyoming, which had slightly lower per PYE utilization rates.

Analgesics – As shown in Table 6-16, analgesic use peaked in the 45 - 64 age group. Women had per PYE utilization rates twice that of men, with a similar ratio seen between whites and blacks. There was little variation in geographic residence. States had very similar per PYE utilization rates.

#### **6.4 Expenditures of Most Common Medicaid Prescription Drugs by Medicaid Eligibility Category**

In the aggregate analyses of expenditures across states, per PYE expenditures are used as the dependent variable, as explained previously. The following analysis examines prescription drug expenditures for selected therapeutic categories by MAS/BOE across the eight states. Section 6.5 examines drug utilization by demographic characteristic across the eight states. The three therapeutic categories examined are antihistamine/serotonin drugs, antibiotics, and psychoactives. They were chosen because they represented the three therapeutic categories with the highest expenditures across the eight study states. Similarities across the eight states are noted, as are differences. Speculation for marked state differences is provided in the text as well as the following chapter examining the role of Medicaid drug reimbursement and cost-containment policies in prescription drug utilization and expenditures.

Antihistamine/Serotonin Drugs – As shown in Table 6-17, Georgia appears to have the lowest per PYE expenditures rates relative to the other seven states. This may be due in part to the fact that Georgia is the only state to have a prior authorization program for H2-antihistamine blockers, used to treat ulcer disease. Kentucky, New Jersey, and Wyoming had the highest per PYE expenditures, with the Kentucky medically needy having the highest per PYE spending (\$208.66/PYE enrollee).





Antibiotics -- Kentucky, which is the only state to have a prior authorization program for antibiotics, has some of the highest per PYE expenditures (Table 6-18). Kentucky's pre-1988 expansion blind and disabled group had the highest per PYE spending (\$127.20/PYE enrollee). California has some of the lowest per PYE spending rates.

Psychoactives -- As shown in Table 6-19, variation in psychoactive expenditures across the eight states is not consistent. Kentucky has the highest per PYE spending, with the categorically needy - non cash blind and disabled spending an average of \$244.85/PYE enrollee.

## **6.5 Expenditures of Most Common Medicaid Prescription Drugs by Demographic Characteristics**

Antihistamine/Serotonin Drugs -- As expected, expenditures for the antihistamine/serotonin drugs peaked in the 45 to 64 age group (Table 6-20) for most states. Kentucky had the highest per PYE spending for this group (\$153.54/PYE enrollee), while Georgia has the lowest spending (\$48.32/PYE enrollee). Women consistently spent slightly more on this drug category than did their male counterparts. White expenditures exceeded those of black enrollees by up to a factor of 2.5. Black spending exceeded Hispanic expenditures. Rural enrollees had the highest expenditures.

Antibiotics -- Expenditures generally followed utilization patterns, with the highest per PYE spending noted in children aged 1-5 (Table 6-21). Kentucky and New Jersey had some of the highest spending rates relative to other states. No strong gender differences were noted, and white and Hispanic per PYE utilization exceeded that of black spending.

Psychoactives -- Psychoactive use peaked in the 45 - 64 age group, with New Jersey having the highest rates among this demographic group (\$178.69/PYE enrollee) and Georgia having the lowest spending per PYE enrollee (\$73.28) (Table 6-22). Women had slightly higher psychoactive per PYE expenditures than men in all states except California and New Jersey. Whites had expenditure rates up to five times higher than spending among blacks; in New Jersey, white per PYE expenditures were \$104.58, compared to black expenditures of \$23.25. Hispanics lagged even further behind black and white spending. There were slightly higher psychoactive expenditures by urban enrollees relative to rural enrollees.



## 7.0 UTILIZATION AND EXPENDITURES OF PRESCRIPTION DRUGS BY MEDICAID DRUG REIMBURSEMENT AND COST-CONTAINMENT POLICIES

The utilization and expenditures of prescription drugs to Medicaid beneficiaries can be restricted in many ways by State Medicaid programs. In order to determine how states restricted prescription drugs in 1992, we surveyed the eight state programs used in this analysis. Appendix B provides a copy of the survey instrument. Seven of the eight states responded; answers for Missouri are imputed from *Pharmaceutical Benefits Under State Medical Assistance Programs* (National Pharmaceutical Council, 1993).

### 7.1 Pharmacy Practice Characteristics in Eight Selected States, 1992

Table 7-1 summarizes key aspects of pharmacy practice in the eight study states. These key aspects include:

- number of pharmacies per state
- number of pharmacies serving Medicaid recipients per state
- extent of drug benefit coverage by MAS/BOE
- whether states reimbursed for over-the-counter (OTC) medications
- whether the state provided Medicaid recipients with a mail order option
- whether prescription drugs were bundled into nursing home charges
- percent of the Medicaid population covered under a capitated payment system

Pharmacies per State – The number of pharmacies per state is associated with the population size of that state. Thus, California, the largest of the study states, has the greatest number of pharmacies, whereas Wyoming, one of the smallest study states, has the fewest pharmacies.

Medicaid Pharmacies per State – We asked each surveyed state to estimate the number of pharmacies which participate in Medicaid. By comparing the number of pharmacies participating in Medicaid with the total number in the state, we could examine the extent of access by Medicaid recipients to prescription drugs in each state. Many states reported that 100 percent of their pharmacies were Medicaid participants, while the remainder reported relatively high participation rates.

Pharmaceutical Care Coverage by MAS/BOE – Although prescription drug benefits are an optional service provided by State Medicaid programs, currently all states offer such benefits. Once a state decides to offer optional benefits, those benefits must be available to all categorically needy recipients. Coverage to medically needy recipients remained optional.





Only three states – Delaware, Missouri, and Wyoming – offered prescription drug coverage only to categorically needy eligible. Delaware and Wyoming did not have medically needy programs.

OTC Coverage – Over-the-counter medications are often considered suitable treatments for medical conditions. Only Alabama did not reimburse for any OTC products. The remaining responding states reimbursed OTC medications if the recipient presents a written prescription for the drug to the pharmacy and/or require prior authorization prior to reimbursement.

Mail order Pharmacy – The use of mail order pharmacy services is viewed as a potentially cost-efficient and effective means for dispensing medications, particularly those used to treat chronic medical conditions. Two states – California and Kentucky – offered Medicaid recipients prescription drugs through a mail order service in 1992.

Prescription Drug Bundling – Delaware and Wyoming noted that nursing homes in their states bundle over-the-counter drug claims into total nursing home charges. Yet, no homes bundled prescription drug charges in 1992.

Percent Capitation – In 1992, two states had a capitation program in their Medicaid system. California covered 18 percent of its Medicaid enrollees under a capitated system, and New Jersey had 12 percent of its Medicaid population so covered.<sup>1</sup>

## **7.2 Pharmacy Regulatory Policy Provisions in Eight Selected States, 1992**

State Medicaid programs have restricted utilization and expenditures for prescription drugs in a number of ways. Other than Federal Medicaid provisions which allowed for Maximum Allowable Cost (MAC) limits on certain multiple-source prescription drugs, all other strategies to lower drug use and costs occur at the State level. In 1992 and before, the states were constrained primarily to mechanisms which limited the volume of and reimbursement for prescriptions. Table 7-2 summarizes the key policy provisions instituted in the eight study states in 1992:

- limits on the number of prescriptions per given time period
- limits on the number of refills per given time period
- limits on the days supply of prescriptions
- patient copayments
- formularies
- prior authorization requirements

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<sup>1</sup>In 1992, New Jersey was in the process of moving the entire AFDC Medicaid population into a capitated managed care program.





- drug utilization review
- generic substitution

While several of these control policies (e.g., quantity limits, copayments) focus on all reimbursed prescription drugs, others (e.g., prior authorization, drug utilization review) are drug-specific. That is, these provisions may only apply to specific drugs and/or specific therapeutic drug categories. This is a significant differentiation, as the use of some drugs and/or therapeutic drug categories may be more stringently controlled than others, thereby leading to differential access according to therapeutic regimen.

Quantity limits – Quantity limits include limits on the number of prescriptions, the days supply of the prescription, and the number of allowable refills. Although a form of utilization control, quantity limits are considered to have the added benefit of improving continuity of patient care and hence, patient outcomes and quality-of-life.

Quantity limits do impact prescription drug utilization. For example, a cap of three prescriptions per person per month was associated with a 35 percent decline in the use of certain drugs (Soumerai *et al.*, 1991). The cap also led to an increase in nursing home admission rates. Additional studies have documented the association between prescription caps and a subsequent increase in nursing home admissions and other non-drug services utilization (Kozma, 1990; Lingle, 1987; Soumerai *et al.*, 1994).

Only two states (Delaware and Missouri) had no limits on the number of new and refill prescriptions. The two states which did limit the number of prescriptions imposed a ceiling of 5-6 prescriptions/month. California required prior authorization after the limit of six prescriptions per month had been exceeded. Similar limits for refill prescriptions were established in three states. Days supply limits ranged from 30 to 100 days. Days supply varied within states according to whether the medication was used for acute or chronic conditions and, sometimes, whether the medication was prescribed upon discharge from the hospital. No state had what might be considered extreme or stringent quantity limits.

Patient Copayments – Patient cost-sharing arrangements for prescription drugs under Medicaid generally are limited to copayments. Patient copayments require recipients to pay a nominal amount toward the cost of a prescription. Of the eight study states, only three (Delaware, Kentucky, and New Jersey) had no patient copayment provisions. Copayment amounts for states with the policy ranged from \$0.50 to \$3.00. Georgia had the smallest copayment requirement, while Alabama had the highest copayment amount. Alabama and Missouri each had "sliding scale" copayments, in which the copayment to be paid is based on the cost of the prescription. Exemptions from copayments in most states included children,



patients in long term care facilities, pregnant women, those requiring family planning drugs and supplies, and hospice patients.

Studies have shown that implementing patient copayments results in decreased prescription drug utilization (Liebowitz *et al.*, 1985; Lohr *et al.*, 1986; Foxman *et al.*, 1987; Harris *et al.*, 1990; Reeder and Nelson, 1985; Nelson *et al.*, 1984; Smith, 1993). This phenomenon is found universally, regardless of the health care delivery system. In a series of articles, Soumerai and colleagues (1987, 1990, 1991) found that particular limitations placed on Medicaid recipients' drug coverage decreased prescription drug utilization, with notable effects on patient outcomes. One study (Soumerai *et al.*, 1987) found that a \$1 copayment was associated with virtually no change in the number of filled prescriptions, but was associated with a significant decrease in the Medicaid drug budget, suggesting a cost-shifting effect of copayments. While several studies suggest that copayments have a greater impact on decreasing discretionary drug use (Harris *et al.*, 1987; Reeder and Nelson, 1985; Brian and Gibbons, 1974; Lohr *et al.*, 1986), others contend that the use of medically necessary drugs is decreased, leading to adverse effects on patient outcomes (Ross-Degnan *et al.*, 1993).

Prior Authorization -- Prior authorization for prescription drugs is a procedural regulation that is gaining favor as an effective care management and cost-containment strategy. PA is a "gatekeeper" access-limiting procedure which restricts access to costly or questionable goods and services. Under prior authorization, liability for reimbursement is determined prior to the time prescription drug services are provided (Richards, 1986). It can improve care and quality of life, thereby decreasing inappropriate drug utilization and spending. However, as prior authorization is a fairly recent cost-containment strategy, little evidence exists to document this assertion.

The Omnibus Reconciliation Act of 1990 (OBRA 1990) provided impetus for the growth of prior authorization. Under OBRA 1990, state Medicaid formularies were required to include all prescription products of manufacturers who signed rebate agreements. Thus, the use of formularies, which had long been a primary use and cost-control mechanism used by state drug benefits managers, was essentially prohibited. States maintained the right, however, to require physicians to request and receive official permission before a particular product could be dispensed and reimbursed. States may not operate a prior authorization plan unless the State provides for a response within 24 hours of a request and provides for a 72 hour emergency supply of the medication. From January 1991 through December 1993, states were





not allowed to place newly approved pharmaceutical products under prior authorization policies until six months after approval.<sup>2</sup>

The Congressional intent of OBRA 1990 was not to encourage the use of prior authorization, but rather to make it available to states for the purpose of controlling the utilization of drugs which have narrow indications for use and/or high abuse potential. However, a number of states have indicated that they intend to continue and/or expand prior authorization programs. Some critics are concerned that prior authorization may have the effect of denying Medicaid patients access to needed medications (National Pharmaceutical Council, 1993; Ross-Degnan *et al.*, 1993).

Four of the eight study states (California, Georgia, Kentucky, New Jersey) had prior authorization programs in place in 1992. State Medicaid programs include varying services and coverage within prior authorization programs. Some states, such as Georgia, Kentucky, and California, have very comprehensive prior authorization programs which cover a large number of widely prescribed drugs, dosage and quantity requirements, mandates for generic use, and duration of therapy. Other states, such as New Jersey, have minimal guidelines and require prior authorization only for a narrow range of drugs (e.g., anti-obesity products, over-the-counter protein replacements, and methadone) which demonstrate questionable efficacy and safety. Some of the drug categories falling under prior authorization requirements are noted in Table 7-3.

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<sup>2</sup>OBRA 1993 (P.L. 103-213) repealed components of the OBRA 1990 legislation, including the anti-formulary provision and the six-month window for prior authorization of newly approved drugs. However, since the study period (1992) occurs before passage and implementation of OBRA 1993, these revisions are not of interest to the study.



TABLE 7-3

## DRUGS INCLUDED IN PRIOR AUTHORIZATION POLICIES

<u>Drug Category</u>	<u>California</u>	<u>Georgia</u>	<u>Kentucky</u>	<u>New Jersey</u>
Anorectics/CNS Stimulants	X	X	X	X
Tranquilizers	X	X*	X	
Investigational New Drugs	X			
H2 Inhibitors	X	X		
Non-steroidal Anti-inflammatory Agents	X	X	X	
Anabolic Steroids		X		
Growth Hormone		X		
Antibiotics	X		X	
Immune Globulin		X		
Narcotics	X		X	X**
Antivirals	X		X	

\*Benzodiazepines only

\*\*Methadone only

Post-OBRA 1990 Formulary -- Two states noted that they maintained a formulary of some restricted drugs despite the passage of OBRA 1990. California has maintained a semirestrictive formulary for more than 20 years, with no changes made due to OBRA 1990. Kentucky also maintained a limited formulary after "best price" agreements were reached with various manufacturers. Details on specific drugs and drug categories placed on formularies were not available.

Drug Utilization Review (DUR) -- Drug utilization review is a structured and continuing program that reviews, analyzes, and interprets patterns of drug use in a given delivery system against predetermined standards and includes efforts to control drug use patterns not consistent with these standards (Brodie, 1972). More recently, DUR has been



expanded to include efforts to correct inappropriate patterns of use (Lipton and Bird, 1994), a mechanism for measuring the effectiveness of corrective actions taken to normalize undesirable patterns of use (Kralweski *et al.*, 1994), remedial strategies for improving physician prescribing patterns, and program evaluation to assess the impact of remediation efforts (Knoben, 1981; Rucker, 1983; Fassett and Christensen, 1986). The ability of computerized DUR to provide sophisticated profiles of providers and patients may form the foundation for physician education programs and patient-oriented education (Pollard, 1990; Avorn and Soumerai, 1983; Soumerai and Avorn, 1986). Because DUR encompasses many different implementation and administrative components, evaluation of DUR initiatives is difficult.

DUR is a prominent component in the OBRA 1990 legislation. The act mandated that state Medicaid programs implement the following DUR-related activities: 1) prospective and retrospective DUR programs based on explicit criteria; 2) the offer of drug counseling to Medicaid patients by community-based pharmacists; and 3) face-to-face educational intervention programs designed to improve drug prescribing. In 1992, all states except Delaware and Missouri had retrospective DUR programs in place. No states responded that they had implemented a prospective DUR program. OBRA 1990 mandated that all states have a DUR program in place by January 1, 1993.

Generic Substitution – Promotion of generic products has been a popular drug use and cost-containment strategy used by state Medicaid providers. While some state programs mandate the substitution of generic products when available, other states encourage the use of generic substitutes by having differential copayments for generic and brand name products or by encouraging pharmacists to dispense generics by increasing the dispensing fees of generics relative to brand name drugs. It is not evident if any of the eight study states used incentives for encouraging generic substitution. Only California, Kentucky, and New Jersey had mandatory generic substitution policies in place in 1992.

### **7.3 Impact of Pharmacy Regulatory Policy Provisions on Drug Utilization and Expenditures**

Examination of Table 7-2 reveals that some states, such as California, Georgia, Kentucky, and New Jersey, tend to have relatively more restrictions regarding prescription drug controls than the remaining states. This section will address the question: How does reimbursement restrictiveness impact drug utilization and expenditures? In addressing this question, emphasis will be placed on examining the impact of four specific cost-control policies





– prescriptions limits, copayments, prior authorization, and mandatory generic substitution – on prescription drug utilization and costs.

In reviewing this section, it is important to keep several caveats in mind:

- 1) Due to the small sample size (8 states), testing for statistical significance is impossible. That is, absolute differences in drug use and spending between states cannot be quantified. Thus, the analysis is primarily qualitative in nature and is not intended to be viewed as statistically rigorous.
- 2) Multivariate analysis at the state level cannot be conducted due to the small sample size.
- 3) Other potential explanatory and confounding factors, which can affect demand and hence utilization and expenditures, should be considered when discussing state differences in prescription drug utilization and expenditures. Some of these factors include: population mix (e.g., preponderance of elderly, children, and/or disabled populations can impact volume and types of drugs used); geographic proximity of and marketing strategies by pharmaceutical companies; and distribution of physicians, hospitals, and other health care providers and services.

#### **7.4 Impact of Prescription Limits on Drug Utilization and Expenditures**

Table 7-4 summarizes state variation in drug use and spending according to how restrictive the state is in limiting the number of prescriptions reimbursed per month. Two states – California and Georgia – imposed prescribing limits. California allows six prescriptions per month, with additional prescriptions requiring prior authorization. Georgia allows adults to receive 5 prescriptions/month, while children can receive 6 prescriptions/month. No other states imposed prescription limits. Because prescription limits can be particularly problematic to the very old, who have disproportionately more prescriptions than the rest of the population, average per PYE utilization (Rxs/75+PYE) and expenditures (\$/75+PYE) for this group are also included.



TABLE 7-4

DRUG UTILIZATION AND SPENDING BY STATE, STRATIFIED BY PRESENCE OF PRESCRIPTION LIMITS, 1992

	PRESCRIPTION LIMITS		NO PRESCRIPTION LIMITS					
	<u>CA</u>	<u>GA</u>	<u>AL</u>	<u>DE</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
RXs/PYE	12.87	14.11	16.57	11.82	18.32	18.09	16.54	10.76
RXs/75+ PYE	25.95	35.40	37.34	30.49	56.98	51.29	37.77	42.06
\$/PYE	\$279.36	\$288.05	\$351.31	\$281.02	\$376.44	\$377.65	\$457.16	\$251.48
\$/75+ PYE	\$624.51	\$739.52	\$785.07	\$683.86	\$1069.89	\$981.62	\$983.57	\$994.69

Two states without prescription limits – Wyoming and Delaware – had lower per PYE utilization rates lower than California and Georgia, which had prescription limits. However, only Wyoming had lower expenditures, and Delaware's average expenditures were comparable to those in California and Georgia. Elderly per PYE utilization and spending in California and Georgia were among the lowest, with only Delaware lower than Georgia in both average per PYE utilization and expenditures.

## 7.5 Impact of Patient Copayments on Drug Utilization and Expenditures

In 1992, five states had patient copayment provisions. These states varied in the amount of copay required – Georgia had the lowest copayment (\$0.50), while Alabama had copayments which varied from \$0.50 to \$3.00. Variation in copayments within a state generally reflected the total cost of the prescription, with higher copayments required for more expensive (or brand name) medications. Table 7-5 illustrates the association of patient copayments on drug use and spending among the eight study states.





TABLE 7-5

DRUG UTILIZATION AND SPENDING BY STATE, STRATIFIED BY PATIENT  
COPAYMENTS, 1992

	PATIENT COPAYMENTS					NO PATIENT COPAYMENTS		
	<u>AL</u>	<u>MO</u>	<u>CA</u>	<u>WY</u>	<u>GA</u>	<u>DE</u>	<u>KY</u>	<u>NJ</u>
RXs/PYE	16.57	18.09	12.87	10.76	14.11	11.82	18.32	16.54
\$/PYE	\$351.31	\$377.65	\$279.36	\$251.48	\$288.05	\$281.02	\$376.44	\$457.16

There appears to be no association between patient copayments and average per PYE utilization and expenditures.

#### 7.6 Impact of Prior Authorization on Drug Utilization and Expenditures

Prior authorization had begun to replace formularies by 1992. Four states -- California, Georgia, Kentucky, and New Jersey -- had prior authorization programs in place. As with all cost-containment policies, prior authorization programs varied in the degree of their restrictiveness. As described previously, California had the most stringent program, whereas New Jersey's program was considerably more modest in scope. Table 7-6 summarizes the association of prior authorization on drug utilization and expenditures across the eight study states in 1992.



TABLE 7-6

DRUG UTILIZATION AND EXPENDITURES BY STATE, STRATIFIED BY PRESENCE OF PRIOR AUTHORIZATION PROGRAMS, 1992

	PRIOR AUTHORIZATION				NO PRIOR			
	AUTHORIZATION							
	<u>CA</u>	<u>GA</u>	<u>KY</u>	<u>NJ</u>	<u>AL</u>	<u>DE</u>	<u>MO</u>	<u>WY</u>
RXs/PYE	12.87	14.11	18.32	16.54	16.57	11.82	18.09	10.76
\$/PYE	\$279.36	\$288.05	\$376.44	\$457.16	\$351.31	\$281.02	\$377.65	\$251.48

Both California and Georgia, which have comprehensive prior authorization programs, are among the states with the lowest average per PYE utilization and expenditures (ranked third and fourth in utilization, and second and fourth in expenditures, respectively). However, prior authorization does not appear to be associated with lower utilization and spending for the remaining two prior authorization states.

Because prior authorization tends to be drug or drug category specific in its purpose, overall use and spending rates are not as revealing as therapeutic category comparisons might be. However, due to data limitations, it was not possible to examine more specific drugs or drug categories. The HICL drug categorization system specified for this study was too broad to allow drug-specific analyses.

### 7.7 Impact of Mandatory Generic Substitution on Drug Utilization and Expenditures

In 1992, three states -- California, Kentucky, and New Jersey -- had a mandatory generic substitution policy. The remaining four states had a voluntary generic substitution policy (the status of Missouri is unknown). Table 7-7 summarizes the association of mandatory generic substitution policies with per PYE utilization and spending.



TABLE 7-7

DRUG UTILIZATION AND SPENDING BY STATE, STRATIFIED BY TYPE OF GENERIC DRUG SUBSTITUTION, 1992

	MANDATORY GENERIC SUBSTITUTION			NO GENERIC SUBSTITUTION			
	<u>CA</u>	<u>KY</u>	<u>NJ</u>	<u>AL</u>	<u>DE</u>	<u>GA</u>	<u>WY</u>
RXs/PYE	12.87	18.32	16.54	16.57	11.82	14.11	10.76
\$/PYE	\$279.36	\$376.44	\$457.16	\$351.31	\$281.02	\$288.05	\$251.48

With the exception of California, mandatory generic substitution appears to have little association with average per PYE utilization and expenditures. Both Kentucky -- second highest in expenditures and highest in utilization -- and New Jersey -- ranked highest in expenditures -- require generic substitution.

### 7.8 Impact of All Restrictions on Drug Utilization and Expenditures

Finally, the eight study states were ranked in order of overall restrictiveness. The four policies considered above -- prescription limits, patient copayments, prior authorization, and mandatory generic substitution -- were used to determine restrictiveness. Each state was ranked based on the number of policies it had implemented in 1992, with the most restrictive state(s) having the most policies. Thus, California had the highest restrictiveness ranking (4), as it had implemented all four of the policies. The ranking of the states is as follows:

California - 4  
 Georgia -- 3  
 Kentucky -- 2  
 New Jersey -- 2  
 Alabama -- 1  
 Missouri -- 1  
 Wyoming -- 1  
 Delaware -- 0





Table 7-8 summarizes the association between restrictiveness ranking and per PYE utilization and expenditures for each of the eight study states.

TABLE 7-8

DRUG UTILIZATION AND SPENDING BY STATE, CLASSIFIED BY OVERALL RESTRICTIVENESS, 1992

	MOST RESTRICTIVE				LEAST RESTRICTIVE			
	<u>CA</u>	<u>KY</u>	<u>GA</u>	<u>NJ</u>	<u>DE</u>	<u>WY</u>	<u>AL</u>	<u>MO</u>
RXs/PYE	12.88	18.32	14.11	16.54	11.82	10.76	16.57	18.09
\$/PYE	\$279.36	\$356.44	\$288.05	\$457.16	\$281.02	\$251.48	\$351.31	\$377.65

There appears to be little association between total restrictiveness and average per PYE utilization and expenditures. The exception to this rule, California, ranked second lowest in average per PYE expenditures and third lowest in average per PYE utilization, and is considered to be the most restrictive state. Kentucky is considered one of the moderately restrictive states, yet had among the highest use and costs. This finding was supported by earlier analyses which consistently showed Kentucky to have among the highest average per PYE utilization and expenditures rates for specific therapeutic drug categories.

Possible reasons for the lack of consistent and expected relationships between restrictive drug policies and average per PYE utilization and expenditures are many, and include:

- 1) Lack of information on potential confounding variables -- Information on availability of other resources, such as physician and hospital supply, which may affect drug utilization, were not considered for this analysis.
- 2) Measurement of the dependent variables -- Per PYE utilization and expenditures may not have been the best measures of use and spending. Per user rates may have demonstrated more marked associations. Other measures, not considered in this study, include enrollee and/or user rates calculated on a per 1,000 capita basis. Also, using per PYE utilization and expenditures by therapeutic categories might change the association between policy restrictions and utilization and spending rates.



- 3) Lack of detail at the patient level – Controlling for patient need (e.g., diagnoses, prior use, etc.) and other co-current drug use would have provided a more complete picture of drug utilization and spending by therapeutic category.
- 4) Lack of information on other policies and programs implemented at the state level – Other information to be considered in explaining differences among states in prescription drug utilization and expenditures include total Medicaid funding available; proportion of funding allocated to prescription drug services; access to pharmacies; classification of individuals into MAS/BOE eligibility groups; and resolution of missing data from key categories (e.g., race/ethnicity and gender).
- 5) The possibility that the degree of a state's pharmaceutical benefits coverage is associated with utilization and expenditures -- Three states (Delaware, Wyoming, and Missouri) did not provide pharmaceutical benefits to the medically needy. Two of these states--Delaware and Wyoming--had the lowest utilization and expenditures. Thus, the extent that the medically needy population drives drug utilization and spending may be a primary factor in determining states' drug use and spending budgets.
- 6) Lack of detailed drug data -- The HICL therapeutic drug classification system precludes more drug-specific analysis. It is not always clear how some specific drugs or narrowly-defined therapeutic categories are classified. Also, the possibility for improper coding exists.





## 8.0 SUMMARY OF FINDINGS

In this study, we used Medicaid enrollment and prescription drugs claims information for the year 1992 for eight states in the Medicaid Statistical Information System (MSIS).<sup>1</sup> We compared the states in terms of amounts spent on prescription drugs by Medicaid enrollees (on a person-year-equivalent basis) and the number of prescriptions used on average. We examined use and spending rates by demographic and Medicaid eligibility characteristics. For major therapeutic drug categories, we examined drug use and spending patterns across various enrollee groups identified by demographic and enrollment characteristics. Finally, we carried out multivariate regressions at the county level to determine how various factors account for variation in drug use and spending.

### 8.1 DESCRIPTIVE FINDINGS

#### Overall Differences in Use and Spending Rates Across States

We found that among the eight study states, Missouri had the highest prescription drug spending as a percentage of total Medicaid spending followed by Alabama and Kentucky. On average, across all eight states, prescription drug spending accounted for 9.7 percent of total Medicaid expenditures.

Rates of utilization (in terms of the number of prescriptions used) and spending on prescription drugs were calculated by dividing total use and spending by the number of person-year equivalent (PYE) enrollees. PYE totals were calculated by dividing the total number of eligible months by twelve. This adjustment was done to reflect the different lengths of time that a Medicaid eligible could be enrolled in Medicaid.

Using PYE measures, states can be classified into high, medium, and low cost categories based on prescription drug cost per PYE enrollee. California, Delaware, Wyoming, and Georgia can be considered as low cost states with cost per PYE ranging from \$250 to \$290. Alabama, Kentucky, and Missouri can be considered as moderately expensive states with costs ranging from \$350 to \$380 per PYE. New Jersey was the highest cost state in terms of spending per PYE (\$457). Variations in cost across states are largely due to enrollee mix differences along age, race, and eligibility dimensions.

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<sup>1</sup> The study states were selected based on several criteria, most important of which, of course, was the availability of MSIS data on prescription drug claims. In addition, we included states with varying mix of per capita drug spending and reimbursement policies.



## Differences by Eligibility and Demographic Characteristics

When we analyzed the data by Basis of Eligibility (BOE) categories, we found, as expected, that children generally had the lowest use and cost rates across all states and eligibility categories. Aged, and blind and disabled enrollees had the highest use and cost rates (several times greater than children). Among cash and non-cash enrollees, adults cost about two to three times more than children.

Full-year enrollees consistently used and incurred higher drug costs than part-year and discontinuous (multi-period) enrollees. Costs for part-year enrollees were only around 30 to 40 percent of the costs for full-year enrollees in most states. Full-year enrollees tend to be disproportionately older and this could account for some of the differences.

It was difficult to compare use and cost rates across states based on Maintenance Assistance Status (MAS) and BOE status of the enrollees because states did not follow consistent reporting patterns. Four of the eight study states had medically needy programs. Four states reported significant (more than 100 PYEs) number of aged and blind and disabled enrollees in the pre-1988 expansion category. Other than Wyoming, all states reported some enrollees in the post-1988 expansion category. The aged enrollees in this MAS category, however, many fall in the Qualified Medicare Beneficiaries (QMB) category. While states extend some Medicaid benefits to QMBs, these individuals are not covered for prescription drugs unless they would have otherwise qualified for Medicaid. Because of this reason, we found that the use and spending are very low for the aged in the post-1988 expansion group.

We found that utilization increases with age. Children between the ages of 6 and 18 used the least number of prescriptions, and for most states, the oldest enrollees (age 75 and above) used the most. Across all states, females used more drugs per PYE and incurred higher costs per PYE than males. Another finding consistent across states is that whites used more prescription drugs and incurred higher costs than blacks and Hispanics. In Missouri and New Jersey, for example, white enrollees used more than twice the number of prescriptions per PYE relative to blacks. In comparing racial differences, however, it is important to recognize that other differences (demographic and eligibility) may confound the results. For Georgia, we performed some of these adjustments (not reported here) which showed that significant black/white differences remain even after the adjustments.

Four of the five states which reported rural and major urban area enrollments showed 30 to 77 percent higher use and cost rates among rural relative to major urban area enrollees. The only state where rural enrollees incurred lower costs than major urban area enrollees is California. As discussed later in the multivariate analysis, rural enrollees may be incurring higher costs because of their demographic characteristics and eligibility patterns.





## Differences By Therapeutic Drug Categories

The types of therapeutic drug categories used by the Medicaid population varied little across the eight study states. Psychoactives and antibiotics were the two highest utilized drugs. In regard to expenditures, several therapeutic categories – psychoactives, antibiotics, antihistamine/serotonin drugs, and calcium antagonists – vied for the top two positions. Other therapeutic categories ranking in the top 50 percent of drug use or spending include analgesics, drugs which act on the trachea/bronchi, drugs which act on the kidney/urinary tract, cardiac stimulants, drugs which act on the joints, and hypotensives.

Utilization and expenditures measures for key therapeutic categories showed considerable variation across the eight study states. For example, psychoactive prescriptions per PYE ranged from a low of 1.10 (California) to a high of 2.20 (Kentucky). Similarly, expenditures per PYE ranged from \$23.87 (California) to \$53.96 (New Jersey). The average expenditure per psychoactive prescription also showed variation, ranging from \$16.90 (Alabama) to \$25.91 (New Jersey).

Utilization of and spending on selected therapeutic categories by demographic characteristics generally followed expected patterns. For example, per PYE drug used for selected therapeutic categories generally increased with age, peaking at ages 65-74 and declining slightly thereafter, across all eight states. Further, race differentials proved consistent for the eight study states, with notably higher utilization and expenditures among white enrollees compared to black enrollees. There was much more variation in the states in regard to use and spending by Medicaid eligibility status. In general, the blind and disabled and medically needy population were high users and spenders relative to other groups. However the pre-1988 expansion group, the aged, and children also accounted, in some states for high drug utilization and/or expenditure patterns. Such differences are due, in part, to different mechanisms used by states to classify recipients into eligibility categories.

In three states, variations may be due to differences in the drugs used by various populations. For example, Kentucky consistently had notably higher use rates for antibiotics, analgesics, and psychoactives. Psychoactive drug use was particularly variable in Kentucky, with the categorically needy (non-cash), medically needy, and the pre-1988 expansion group enrollees showing much higher drug use than their counterparts in all other states. Expenditures for psychoactives in Kentucky were also considerably higher.

Although looking at broad therapeutic drug categories is useful in identifying high use and cost areas in State Medicaid drug programs, it is necessary to examine potentially problematic drug classes at the individual drug level. For example, States and HCFA would be interested in knowing more detailed information about the psychoactive drugs, a category





consistently among the highest use and spending drug classes. Are antidepressants responsible for high use and spending, or are anxiolytic medications? Are the newer, more expensive serotonin reuptake inhibitors (SRI's such as fluoxetine (Prozac)) accounting for this large share? What populations are using the SRI's? Questions such as these are necessary for States to determine sound and responsible reimbursement policies. Fortunately, such analysis is possible using the MSIS drug claims data, although these data are currently available for only 26 states.

## 8.2 MULTIVARIATE FINDINGS

We performed multivariate regressions of use and spending rates to examine how county average mix of enrollees (in terms of demographic and eligibility characteristics) and other county characteristics affect use and spending rates. We found that states varied considerably in terms of prescription drug use and spending rates even after controlling for Medicaid enrollment and demographic characteristics and area-specific demand variables. Controlling for the various factors explaining drug use (including age, gender, race, blind/disabled status, medically needy status, cash enrollment status, urbanicity, population and physician density and area average income), we found that New Jersey is the highest cost state in terms of Medicaid drug spending per PYE, number of prescriptions per PYE, and average cost of prescriptions. California, on the other hand, had the lowest cost per PYE and lowest rate of utilization. The difference in per capita drug cost between the New Jersey and California Medicaid programs was quite pronounced. California had several cost containment policies (including patient copay, prescription limits, prior authorization requirements, and mandatory generic substitution) in effect. While New Jersey also had two of these four policies, it was not possible to determine how different their implementations were. Evidently, there are unaccounted factors which may explain the difference in cost between these two states.

Missouri was the second highest cost and highest utilizer state among the seven study states (excluding Wyoming). Georgia and Kentucky ranked in the middle in terms of utilization and cost rates, respectively. Cost per prescription was the lowest in Kentucky followed by Alabama; California's cost per prescription was in the middle among the seven states.

Multivariate analysis confirmed some of the patterns we found using descriptive data. This includes higher cost rates among older children, adults and the aged relative to children less than six years of age. Spending (per PYE) is the highest among those aged 45 to 64. For



the same age group and also for the very old (age 75 and above), utilization rates are significantly higher than that of children less than six years of age. Cost per prescription is the highest for two age groups, those between the ages of 19 and 44, and those between 65 and 74.

The blind and disabled enrollees spent more on prescription drugs, used more prescriptions, and spent on more expensive drugs compared with other eligibility groups. Females spent more on drugs than males. Females also used more prescriptions than males although this difference was not as significant as higher prescription prices.

The black-white difference was not very significant (unlike the descriptive finding). Blacks spent significantly less than whites but utilization and drug price differences were not significant. This result was quite puzzling. Perhaps it can be explained by the aggregate analysis rather than person-level analysis. First, many counties had very few (or no) black enrollees; thus, the variable (percentage of black enrollees in each county) did not have as much dispersion of positive values. Second, the weighted regressions assigned more weights to California counties with bigger Medicaid population, and California is the only state where the black-white difference was minimum across states. Finally, person-level inferences will be limited in aggregated models because of possible confounding of left-out variables at the county level and the inability to model within county variations.

Other race categories (which include a large number of enrollees with unknown race) have significantly higher use and cost rates. This result is consistent with descriptive findings. Without any knowledge about the composition of this group, it is difficult to infer anything meaningful.

Cash-receiving enrollees used fewer prescriptions and spent less than the non-cash and the pre-1988 expansion enrollees (omitted MAS category). Medically needy enrollees spent more because of higher costs per prescription. The post-1988 enrollees also cost more for the same reason. This later group consists of QMBs many of whom are not covered for prescription drugs. This is why the utilization rate is lower for this group.

In terms of area-level variables, we found that more Medicaid enrollees live in areas with higher prescription costs. We also found that contrary to descriptive findings in some states, multivariate adjustment results show that urban areas use and spend more per enrollee (although cost per prescription is not different). More physicians and fewer hospital beds were associated with a higher use rate, although hospital admissions did not affect drug utilization rate. More populated counties had a lower use rate but higher cost per prescription. Finally, low income areas had higher Medicaid drug use and spending.





### 8.3 IMPLICATIONS FOR STATE POLICIES

State variation in drug use and spending can be accounted for by differences that states have in implementing and reimbursing for their drug benefits program. Notable among these are reimbursement and cost-containment policies including prior authorization, mandatory generic substitution, patient co-payments and prescription quantity limits that states adopt to control drug use and spending. Of the eight study states, one (Delaware) had none of the four stated policies, while one (California) had all four policies. The remaining states had one to three of the stated policies. We found that California, as expected, had among the lowest per PYE drug utilization and expenditures. However, Delaware also had low per PYE utilization and expenditures, whereas, other restrictive states (e.g., Georgia, Kentucky and New Jersey) had moderate to high drug use and spending.

It was difficult to tease out the policy effects through multivariate analysis because we did not have pre-policy data to conduct a pre-post evaluation of policies. Moreover, states have combinations of policies, and it is difficult to use one state as a control for another to analyze the effects of policies controlling for other confounding factors.

### 8.4 SUGGESTIONS FOR FUTURE RESEARCH USING MSIS DATA

One of the goals of this study was to assess the usefulness of the MSIS data to analyze drug use and spending issues. We found that the data quality was fairly good. It is, however, important to recognize that the usefulness of data depends on the research purpose. To understand the patterns of utilization and spending differences across race, for example, we should be conducting person-level analysis. To examine use and spending patterns within therapeutic categories, as another example, we should be using drug-specific details. Finally, to evaluate reimbursement policies and analyze patient outcomes, we need to analyze longitudinal data with pre- and post-policy periods. In addition to examining the effects of policies on prescription drug use and cost, research should also be done to examine non-drug use and spending. MSIS data should be usable for many of these research efforts in the future.



TABLE 3-1

## CHARACTERISTICS OF THE ANALYTIC DATA FILES

<b>State</b>	<b>Number of Enrollees</b>	<b>Enrollees Missing Eligibility Status</b>	<b>Missing/Invalid Therapeutic Codes</b>	<b>Negative Payment Records</b>
Alabama	483,600	6,050 (1.25%)	0.84%	0.41%
California	4,267,007	105,465 (2.47%)	10.12%	
Delaware	61,098	525 (0.86%)	0.57%	
Georgia	883,264	8,693 (0.98%)	6.47%	
Kentucky	594,744	24,047 (4.04%)	0.22%	0.002%
Missouri	574,426	10,206 (1.78%)	3.97%	
New Jersey	728,840	20,417 (2.80%)	1.39%	0.32%
Wyoming	43,115	1,249 (2.90%)	1.54%	

SOURCE: Medicaid statistical Information System.



TABLE 4-1

## DISTRIBUTION OF MEDICAID ELIGIBILITY GROUPS ACROSS STATES, 1992

	<u>AL</u>	<u>CA</u>	<u>DE</u>	<u>GA</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
<b>TOTAL # OF ENROLLEES</b>	477,550	4,161,542	60,573	874,571	570,697	564,220	708,423	41,866
<b>TOTAL # OF PYEs<sup>1</sup></b>	363,561 (100%)	3,164,053 (100%)	46,158 (100%)	674,650 (100%)	449,072 (100%)	438,576 (100%)	540,164 (100%)	28,700 (100%)
<b>DISTRIBUTION BY MAS<sup>2</sup></b>								
% CATEGORICALLY NEEDY (CASH)	66.57%	70.23%	69.59%	73.12%	71.86%	49.97%	75.75%	61.14%
% CATEGORICALLY NEEDY (NON-CASH)	9.73	8.76	8.82	6.02	3.96	33.57	13.23	35.86
% MEDICALLY NEEDY	-	16.43	-	0.10	7.47	-	0.48	-
% EXPANSION GROUP (PRE-1988)	-	1.30	9.03	5.58	5.13	0.89	5.44	-
% EXPANSION GROUP (POST-1988)	23.70	3.27	12.57	15.17	11.56	15.57	5.10	-
<b>DISTRIBUTION BY BCE<sup>3</sup></b>								
% AGED	16.29	12.53	9.47	12.13	10.88	14.18	12.15	8.49
% BLIND & DISABLED	24.65	17.12	16.24	18.41	22.39	14.90	18.01	10.86
% CHILD	42.97	43.07	52.26	48.68	44.97	48.42	47.64	56.43
% ADULT	15.36	26.17	19.86	20.73	21.74	22.50	22.20	23.06
% OTHER	0.74	1.10	2.17	0.05	-	0.00	-	1.15

## NOTES:

- Indicates no enrollees in reporting category.

<sup>1</sup> Person Year Equivalents<sup>2</sup> Maintenance Assistance Status<sup>3</sup> Basis of Eligibility

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 4-2

## DEMOGRAPHIC DISTRIBUTION OF MEDICAID ENROLLEES ACROSS STATES, 1992

	<u>AL</u>	<u>CA</u>	<u>DE</u>	<u>GA</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
<b>TOTAL # OF ENROLLEES</b>	477,550	4,161,542	60,573	874,571	570,697	564,220	708,423	41,000
<b>TOTAL # OF PYEs<sup>1</sup></b>	363,561 (100%)	3,164,053 (100%)	46,158 (100%)	674,650 (100%)	449,072 (100%)	438,576 (100%)	540,164 (100%)	28,700 (100%)
<b>DISTRIBUTION BY AGE</b>								
UNDER AGE 1								
1-5	4.03%	2.56%	3.67%	3.30%	2.79%	3.13%	2.53%	4.20%
6-18	23.94	19.26	26.42	23.63	19.43	24.06	20.57	25.92
19-44	20.40	24.26	27.64	24.92	25.64	23.64	26.18	27.85
45-64	21.47	29.09	25.39	24.77	27.72	26.55	28.20	28.83
65-74	9.07	9.09	6.00	7.60	10.15	7.40	7.28	4.61
75+	7.63	7.69	4.19	6.13	5.76	5.16	5.81	2.40
UNKNOWN	13.46	8.05	6.69	9.65	8.49	10.05	9.42	6.18
	<b>0.00</b>	<b>0.00</b>	-	-	<b>0.02</b>	<b>0.00</b>	<b>0.00</b>	<b>0.01</b>
<b>DISTRIBUTION BY GENDER</b>								
FEMALE	64.32	61.50	63.17	65.17	61.87	63.37	64.68	63.75
MALE	35.16	38.50	36.79	34.82	38.13	36.63	35.32	36.24
UNKNOWN	0.52	<b>0.00</b>	<b>0.05</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>DISTRIBUTION BY RACE/ETHNICITY</b>								
WHITE	41.02	36.29	40.11	37.31	82.34	69.00	31.83	77.11
BLACK	53.16	13.25	52.08	57.23	12.86	30.92	38.65	2.22
HISPANIC	0.15	28.85	5.54	0.82	0.10	-	20.23	9.42
OTHER	0.31	10.50	0.41	0.40	0.14	0.08	0.77	9.22
UNKNOWN	5.35	11.11	1.87	4.24	4.57	<b>0.00</b>	8.53	2.03
<b>DISTRIBUTION BY RESIDENCE</b>								
MAJOR URBAN COUNTY	13.53	77.39	-	17.79	13.55	21.33	58.69	-
OTHER URBAN COUNTY	45.03	17.80	76.47	38.78	20.96	38.46	41.31	-
RURAL COUNTY	41.43	4.81	21.81	43.43	64.81	39.96	-	-
UNKNOWN	<b>0.01</b>	-	1.72	-	0.68	0.25	<b>0.00</b>	100.00

## NOTES:

- Indicates no enrollees in reporting category.
- Bolded and italicized values are not true zeroes.
- <sup>1</sup> Person Year Equivalents

SOURCE: Medicaid Statistical Information Systems (MSIS)



TABLE 5-1

## STATE EXPENDITURES ON PRESCRIPTION DRUGS AS A PERCENT OF TOTAL AND OUTPATIENT MEDICAID SPENDING, 1992

State	Total Spending on Prescription Drugs	Total Medicaid Spending	Prescription Drug Spending as Percentage of Total Medicaid Spending	Total Outpatient Spending	Prescription Drug Spending as Percentage of Total Outpatient Spending
AL	\$ 123,423,425	\$ 1,107,989,020	11.14 %	\$ 457,607,864	26.97 %
CA	879,906,732	8,938,841,952	9.84	3,282,079,189	26.81
DE	12,776,679	223,947,488	5.71	84,520,497	15.12
GA	191,280,367	2,163,658,386	8.84	942,868,443	20.29
KY	170,243,913	1,577,159,801	10.79	837,847,246	20.32
MO	175,105,942	1,422,551,669	12.31	630,035,226	27.79
NJ	247,831,015	3,026,396,533	8.19	1,037,283,071	23.89
WY	5,342,037	111,514,895	4.79	43,685,859	12.23
All States	1,805,910,110	18,572,059,744	9.72	7,315,927,395	24.68
National					

SOURCE: Data supplied by HCFA based on MSIS paid amounts for 1992 (regardless of year of service).





TABLE 5-2

## PRESCRIPTION DRUG UTILIZATION AND SPENDING IN EIGHT STATES, 1992

STATE	EVER ENROLLED IN 1992	NUMBER PYE* ENROLLEES	USERS		TOTAL NUMBER PRESCRIPTIONS			SPENDING			
			Number	Percent Ever Enrolled	Number	Per User	Per PYE *	Total <sup>a</sup>	Per Prescription	Per User	Per PYE
AL	477,550	363,561	363,791	76.18%	6,025,501	16.56	16.57	\$127,722,928	\$21.20	\$351.08	\$351.31
CA	4,161,542	3,164,053	3,145,626	75.59%	40,751,541	12.95	12.88	\$883,923,003	\$21.69	\$281.00	\$279.36
DE	60,573	46,158	44,026	72.68%	545,684	12.39	11.82	\$12,971,550	\$23.77	\$294.63	\$281.02
GA	874,571	674,650	697,231	79.72%	9,525,674	13.66	14.12	\$194,337,910	\$20.40	\$278.72	\$288.05
KY	570,697	449,072	451,937	79.19%	8,229,438	18.20	18.32	\$169,049,461	\$20.54	\$374.05	\$376.44
MO	564,220	438,576	459,557	81.45%	7,934,587	17.26	18.09	\$165,632,285	\$20.87	\$360.41	\$377.65
NJ	708,423	540,164	574,085	81.04%	8,937,739	15.56	16.54	\$246,943,331	\$27.63	\$430.15	\$457.16
WY	41,886	28,700	31,831	76.03%	308,862	9.70	10.76	\$7,217,552	\$23.37	\$226.74	\$251.48

## NOTES:

- \* Indicates no enrollees in reporting category.
- <sup>a</sup> Totals slightly different from those in Table 5-1 which were based on HCFA calculations.
- \* Person Year Equivalents

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 5-3

## PRESCRIPTIONS PER PYE\* BY VARIOUS ELIGIBILITY GROUPS ACROSS STATES, 1992

	<u>AL</u>	<u>CA</u>	<u>DE</u>	<u>GA</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
<u>MAS/BOE* GROUP</u>								
<b>TOTAL</b>	16.57	12.88	11.82	14.12	18.32	18.09	16.54	10.76
<u>Categorically Needy (Cash)</u>	18.94	14.05	11.52	13.73	17.51	10.19	15.01	9.03
Aged	32.38	21.79	26.93	29.52	34.60	40.96	28.77	26.67
Blind & Disabled	29.56	27.16	29.10	27.49	33.31	37.30	32.24	21.60
Child	4.08	7.01	4.67	5.35	5.34	5.37	7.05	4.73
Adult	10.72	10.06	9.08	10.35	12.43	11.88	13.22	9.41
Other	-	-	-	-	-	-	-	-
<u>Categorically Needy (Non-Cash)</u>	25.53	5.35	7.57	7.34	47.75	35.14	27.00	13.85
Aged	51.05	17.92	24.39	-	92.27	52.30	43.21	47.54
Blind & Disabled	34.56	27.57	25.50	-	75.48	38.71	49.54	22.04
Child	4.69	4.34	5.16	6.37	4.76	6.66	6.14	5.44
Adult	9.14	4.74	8.58	9.88	10.37	10.94	10.59	7.83
Other	4.48	2.18	-	-	-	5.33	-	8.85
<u>Medically Needy</u>	-	11.65	-	11.80	17.63	-	6.15	-
Aged	-	28.03	-	29.03	91.19	-	0.00	-
Blind & Disabled	-	29.76	-	34.27	48.86	-	0.14	-
Child	-	6.95	-	8.04	5.58	-	6.94	-
Adult	-	8.03	-	6.52	11.19	-	0.00	-
Other	-	-	-	8.00	-	-	-	-
<u>Expansion Group (Prior to 1988)</u>	-	6.11	26.47	43.96	36.26	9.61	21.59	-
Aged	-	-	37.93	47.34	101.50	48.40	31.21	-
Blind & Disabled	-	-	25.59	39.48	88.95	44.18	39.29	-
Child	-	8.48	6.55	4.07	6.21	9.95	8.00	-
Adult	-	3.82	3.88	41.45	8.37	7.46	3.72	-
Other	-	-	6.27	2.91	-	-	-	-
<u>Expansion Group (1988 and After)</u>	6.24	18.64	5.94	7.69	5.81	7.14	7.72	-
Aged	1.95	28.64	0.45	2.00	1.37	9.50	-	-
Blind & Disabled	-	-	2.33	-	1.96	-	-	-
Child	6.33	6.46	6.97	8.19	6.22	6.79	8.33	-
Adult	7.22	6.58	4.45	8.92	8.03	8.04	6.23	-
Other	-	-	-	-	-	-	-	-
<b>UNKNOWN</b>	10.55	-	-	0.00	9.58	13.00	4.23	-

## NOTES:

- Indicates no enrollees in reporting category.
- Bolded and italicized values have fewer than 100 PYE enrollees or users in the denominator.
- \* Person Year Equivalents
- \* Maintenance Assistance Status
- \* Basis of Eligibility

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 5-4

SPENDING PER PYE<sup>1</sup> BY VARIOUS ELIGIBILITY GROUPS ACROSS STATES, 1992

	<u>AL</u>	<u>CA</u>	<u>DE</u>	<u>GA</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
<b>MAS/BOE<sup>2</sup> GROUP</b>								
<b>TOTAL</b>	\$351.31	\$279.36	\$281.02	\$288.05	\$376.44	\$377.66	\$457.16	\$251.48
<b>Categorically Needy (Cash)</b>	418.35	309.11	291.82	287.74	382.28	191.04	428.83	224.10
Aged	707.15	580.93	735.35	644.52	737.42	842.71	931.00	788.34
Blind & Disabled	694.97	748.01	877.35	666.45	824.86	909.00	1,114.23	702.63
Child	65.22	74.72	64.78	77.72	73.61	75.88	118.59	77.76
Adult	200.16	166.81	226.69	183.26	228.78	227.69	357.06	219.75
Other	-	-	-	-	-	-	-	-
<b>Categorically Needy (Non-Cash)</b>	517.96	102.70	153.40	116.97	869.82	787.89	657.13	300.36
Aged	1,041.97	501.54	739.40	-	1,657.33	1,043.41	979.28	1,110.83
Blind & Disabled	780.04	936.39	783.00	-	1,556.35	1,021.64	1,529.78	621.02
Child	75.60	54.47	73.78	95.19	64.26	114.79	97.02	82.22
Adult	158.39	80.10	177.40	173.70	181.37	207.16	275.51	141.00
Other	85.25	36.34	-	-	-	46.66	-	219.60
<b>Medically Needy</b>	-	247.51	-	337.96	339.47	-	155.45	-
Aged	-	632.84	-	741.40	1,701.00	-	0.00	-
Blind & Disabled	-	1,167.89	-	1,565.02	1,450.60	-	4.26	-
Child	-	84.17	-	180.60	84.13	-	170.34	-
Adult	-	157.37	-	115.32	203.31	-	0.00	-
Other	-	-	-	152.57	-	-	-	-
<b>Expansion Group (Prior to 1988)</b>	-	71.30	602.93	963.78	632.68	166.24	693.53	-
Aged	-	-	799.41	985.72	1,803.81	998.50	992.66	-
Blind & Disabled	-	-	715.33	1,000.55	1,769.55	1,380.91	1,467.88	-
Child	-	87.14	103.57	61.56	83.96	176.80	147.11	-
Adult	-	55.98	52.48	828.00	104.68	99.35	81.22	-
Other	-	-	128.98	41.62	-	-	-	-
<b>Expansion Group (1988 and After)</b>	94.63	356.19	79.52	108.48	81.63	104.00	135.43	-
Aged	30.74	679.59	9.85	51.88	31.20	246.73	-	-
Blind & Disabled	-	-	60.67	-	64.58	-	-	-
Child	94.26	70.27	87.79	112.47	85.86	92.46	116.46	-
Adult	116.54	126.72	78.97	123.96	100.11	117.76	182.17	-
Other	-	-	-	-	-	-	-	-
<b>UNKNOWN</b>	18.16	-	-	0.00	179.86	256.00	419.61	-

## NOTES:

- <sup>1</sup> Indicates no enrollees in reporting category.
- <sup>2</sup> Bolded and italicized values have fewer than 100 PYE enrollees or users in the denominator.
- <sup>3</sup> Person Year Equivalents
- <sup>4</sup> Maintenance Assistance Status
- <sup>5</sup> Basis of Eligibility

SOURCE: Medicaid Statistical Information System (MSIS).





TABLE 5-5

PRESCRIPTIONS PER PYE<sup>1</sup> BY DEMOGRAPHIC CHARACTERISTICS ACROSS STATES, 1992

	<u>AL</u>	<u>CA</u>	<u>DE</u>	<u>GA</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
<b>TOTAL</b>	16.57	12.87	11.82	14.11	18.32	18.09	16.54	10.76
<u>Age</u>								
Under age 1	6.86	9.23	7.33	9.00	4.99	6.67	8.68	5.23
1 - 5	6.03	8.38	6.86	7.45	6.65	6.78	8.84	5.98
6 - 18	4.53	5.32	4.25	4.98	5.54	5.44	6.25	4.49
19 - 44	13.58	10.78	12.50	12.26	15.43	15.74	16.49	10.64
45 - 64	36.79	28.17	35.00	31.97	39.43	44.18	36.84	26.44
65 - 74	34.71	25.31	29.79	31.54	40.64	45.57	34.01	35.36
75+	37.34	25.95	30.49	35.40	56.98	51.29	37.77	42.06
Unknown	4.13	14.47	-	-	73.31	-	-	16.00
<u>Gender</u>								
Female	19.05	13.40	13.06	15.59	20.52	20.23	17.93	11.90
Male	12.21	12.04	9.69	11.35	14.74	14.38	14.00	8.75
Unknown	4.19	36.42	8.83	16.61	22.11	-	-	-
<u>Race/Ethnicity</u>								
White	20.87	14.80	16.04	18.20	18.68	21.58	23.66	11.95
Black	11.60	12.68	8.70	10.48	10.79	10.31	11.70	7.07
Hispanic	7.64	6.89	8.52	6.94	5.60	-	11.19	6.85
Other	8.43	12.38	11.59	10.55	5.25	10.14	10.19	4.02
Unknown	33.62	22.80	17.81	28.93	33.79	-	25.16	18.11
<u>Residence</u>								
Major urban county	12.65	13.34	-	9.41	14.84	14.89	15.68	-
Other urban county	15.48	11.37	11.81	13.39	16.22	15.32	17.77	-
Rural county	19.03	10.96	12.26	16.68	19.35	22.44	-	-
Unknown	3.78	-	6.62	-	54.06	19.82	11.01	10.76

## NOTES:

- Indicates no enrollees in reporting category.
- Bolded and italicized values have fewer than 100 PYE enrollees or users in the denominator.
- \* Person Year Equivalents

SOURCE: Medicaid Statistical Information System (MSIS).



TABLE 5-6

SPENDING PER PYE<sup>1</sup> BY DEMOGRAPHIC CHARACTERISTICS ACROSS STATES, 1992

	<u>AL</u>	<u>CA</u>	<u>DE</u>	<u>GA</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
<b>TOTAL</b>	\$351.31	\$279.36	\$281.02	\$288.05	\$376.44	\$377.65	\$457.16	\$751.48
<b>Age</b>								
Under age 1	84.62	96.00	71.68	102.33	55.49	69.25	107.14	61.95
1 - 5	94.63	91.31	91.93	104.00	96.20	87.17	131.61	90.58
6 - 18	95.16	75.56	94.71	93.60	98.25	104.15	140.66	97.05
19 - 44	293.08	247.88	350.96	252.20	333.60	373.45	519.71	263.65
45 - 64	854.11	727.52	984.03	768.44	948.13	1,073.80	1,218.38	794.40
65 - 74	783.37	682.09	812.69	727.25	890.03	1,018.10	1,077.55	1,008.91
75+	785.07	624.51	683.86	739.52	1,069.89	981.62	983.57	994.69
Unknown	<b>45.04</b>	<b>294.63</b>	-	-	<b>1,273.73</b>	-	-	<b>151.33</b>
<b>Gender</b>								
Female	401.21	282.75	307.44	312.50	408.13	406.05	488.16	274.52
Male	264.49	273.94	235.75	242.30	325.01	328.51	400.38	210.99
Unknown	48.33	<b>988.28</b>	<b>204.89</b>	<b>414.66</b>	<b>427.95</b>	-	-	-
<b>Race/Ethnicity</b>								
White	444.69	367.38	379.43	381.94	377.83	455.16	659.58	282.50
Black	239.14	258.73	205.50	201.51	215.57	204.79	321.06	164.71
Hispanic	152.41	98.70	190.32	115.66	87.31	-	245.06	139.31
Other	179.03	156.23	317.59	175.41	90.69	346.68	330.37	76.58
Unknown	765.48	601.83	534.82	674.22	818.84	-	832.84	483.92
<b>Residence</b>								
Major urban county	275.05	287.43	-	194.10	298.17	319.78	440.38	-
Other urban county	331.44	251.07	287.44	268.61	327.48	327.79	481.00	-
Rural county	397.88	254.11	271.98	343.89	402.52	456.41	-	-
Unknown	<b>59.83</b>	-	110.01	-	958.20	398.94	<b>356.20</b>	251.48

## NOTES:

- Indicates no enrollees in reporting category.
- Bolded and italicized values have fewer than 100 PYE enrollees or users in the denominator.
- <sup>1</sup> Person Year Equivalent

SOURCE: Medicaid Statistical Information System (MSIS).





TABLE 5-7

## PRESCRIPTION UTILIZATION AND SPENDING BY ELIGIBILITY DURATION ACROSS STATES, 1992

	<u>AL</u>	<u>CA</u>	<u>DE</u>	<u>GA</u>	<u>KY</u>	<u>MO</u>	<u>NJ</u>	<u>WY</u>
<b>TOTAL # OF ENROLLEES</b>	477,550	4,161,542	60,573	874,571	570,697	564,220	708,423	41,866
<b>TOTAL # OF PYEs<sup>1</sup></b>	363,561	3,164,053	46,158	674,650	449,072	438,576	540,164	28,700
% FULL YEAR	60.81	59.69	59.45	61.35	65.18	64.05	65.56	47.11
% PART YEAR	24.83	36.73	36.41	34.35	31.73	33.11	32.29	46.28
% DISCONTINUED	14.36	3.58	4.14	4.31	3.09	2.85	2.15	6.61
<b>PRESCRIPTIONS PER PYE<sup>1</sup></b>	16.57	12.88	11.82	14.12	18.32	18.09	16.54	10.76
FULL YEAR	22.12	17.30	15.64	18.07	23.41	22.69	20.12	14.85
PART YEAR	5.86	6.04	6.11	7.58	8.45	9.14	9.63	7.10
DISCONTINUED	11.57	9.32	7.09	9.89	12.49	18.55	11.33	7.19
<b>EXPENDITURES PER PYE<sup>1</sup></b>	\$351.31	\$279.36	\$281.02	\$288.05	\$376.44	\$377.66	\$457.16	\$25.43
FULL YEAR	479.10	566.94	392.40	378.29	489.40	475.55	565.49	365.32
PART YEAR	111.25	111.80	116.86	139.15	155.21	182.23	247.37	145.06
DISCONTINUED	225.23	205.01	125.63	190.24	265.44	447.81	304.93	154.80

NOTE: <sup>1</sup> Person Year Equivalents

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 5-8

VARIABLES USED IN REGRESSION AND WEIGHTED (BY TOTAL PYE<sup>1</sup>) MEANS

Variable	Description	Weighted Mean
<i><u>Dependent Variables</u></i>		
PAIDPYE	Medicaid Drug Payment per PYE <sup>1</sup>	\$316.93
RXPYE	Number of Prescriptions per PYE <sup>1</sup>	14.42
PAIDRX	Payment per prescription	\$22.01
<i><u>Independent Variables</u></i>		
AGE 618	% PYEs Ages 6 to 18	24.37
AGE 1944	% PYEs Ages 19 to 44	27.67
AGE 4564	% PYEs Ages 45 to 64	8.66
AGE 6574	% PYEs Ages 65 to 74	6.95
AGE 75	% PYEs Ages 75 and Older	8.89
BLINDDIS	% Blind and Disabled PYEs <sup>1</sup>	18.06
FEMALE	% Female PYEs <sup>1</sup>	62.61
BLACK	% Black PYEs <sup>1</sup>	25.10
ORACE	% Other Non-white PYEs <sup>1</sup>	32.42
MJURB	Major Urban =1, 0 Otherwise	0.54
MNURB	Minor Urban =1, 0 Otherwise	0.27
CASHN	% Categorically Needy (cash) PYEs <sup>1</sup>	69.43
MN	% Medically Needy PYEs <sup>1</sup>	9.81
POST 88	% Post88 PYEs <sup>1</sup>	7.85
MEDICAID	% Medicaid PYE <sup>1</sup> to Total County Population	12.22
GPFPPOP	Primary Care Physicians per 1,000 People	0.27
BEDSPOP	Hospital Beds per 1,000 People	4.65
ADMPOP	Hospital Admissions per 1,000 People	137.34
POPDEN	Population per Square Mile	14.76
INCOME	Income Per Capita (in logs)	9.80
	Income Per Capita (not in log)	\$18,533

NOTE: <sup>1</sup> Person Year Equivalents



TABLE 5-9

REGRESSION COEFFICIENTS USING COUNTY AS THE LEVEL OF ANALYSIS  
(STANDARD ERRORS IN PARENTHESES)

Variable	Spending Per PYE <sup>1</sup>	Prescriptions Per PYE <sup>1</sup>	Spending Per Prescriptions
INTERCEPT	116.38 (204.14)	38.76 ** (9.45)	-33.12 ** (8.04)
<i>States</i>			
ALABAMA	-111.28 ** (20.99)	-0.83 (0.97)	-6.43 ** (0.83)
CALIFORNIA	-131.81 ** (22.63)	-3.56 ** (1.05)	-3.87 ** (0.89)
GEORGIA	-75.63 ** (17.60)	0.39 (0.82)	-6.17 ** (0.69)
KENTUCKY	-67.00 ** (19.43)	1.44 (0.90)	-7.23 ** (0.77)
MISSOURI	23.15 (18.19)	2.57 ** (0.84)	-1.99 ** (0.72)
NEW JERSEY	125.73 ** (17.78)	3.25 ** (0.82)	3.16 ** (0.70)
<i>Age and Disability</i>			
AGE 618	6.58 ** (1.87)	0.20 * (0.09)	0.17 * (0.07)
AGE 1944	3.20 * (1.51)	-0.11 (0.07)	0.36 ** (0.06)
AGE 4564	15.98 ** (2.49)	0.82 ** (0.12)	-0.08 (0.10)
AGE 6574	7.43 ** (2.29)	0.13 (0.11)	0.36 ** (0.09)
AGE 75	8.73 ** (1.60)	0.26 ** (0.07)	0.18 ** (0.06)
BLINDDIS	5.60 ** (1.08)	0.17 ** (0.05)	0.12 ** (0.04)





TABLE 5-9

REGRESSION COEFFICIENTS USING COUNTY AS THE LEVEL OF ANALYSIS  
(STANDARD ERRORS IN PARENTHESES) (continued)

Variable	Spending Per PYE <sup>1</sup>	Prescriptions Per PYE <sup>1</sup>	Spending Per Prescriptions
<i>Gender and Race</i>			
FEMALE	5.59 ** (1.44)	0.13 # (0.07)	0.19 ** (0.06)
BLACK	-0.30 # (0.18)	-0.01 (0.01)	-0.005 (0.007)
ORACE	0.47 * (0.22)	0.04 ** (0.01)	-0.05 ** (0.01)
<i>Medicaid Eligibility</i>			
CASHN	-1.24 ** (0.44)	-0.15 ** (0.02)	0.15 ** (0.02)
MN	2.05 * (0.84)	-0.07 # (0.04)	0.28 ** (0.03)
POST 88	2.92 ** (0.96)	-0.09 # (0.04)	0.33 ** (0.04)
<i>Area Factors</i>			
MEDICAID	0.62 (0.64)	-0.03 (0.03)	0.08 ** (0.03)
MJURB	38.82 ** (7.58)	1.47 ** (0.35)	0.05 (0.30)
MNURB	18.06 ** (5.87)	0.59 * (0.27)	0.06 (0.23)
GPFPPOP (per 1,000)	29.90 # (17.62)	2.61 ** (0.82)	-1.65 * (0.69)
BEDSPOP (per 1,000)	-1.65 ** (0.63)	-0.07 * (0.03)	0.003 (0.02)
ADMPOP (per 1,000)	0.02 (0.03)	-0.0004 (0.001)	0.0001 (0.001)
POPDEN (@10 sq-miles)	-0.03 ** (0.01)	-0.002 ** (0.0004)	0.002 ** (0.0003)
ln (INCOME)	-69.68 ** (14.36)	-3.67 ** (0.66)	1.28 * (0.57)
R <sup>2</sup> (Adjusted)	0.87	0.84	0.79
N	543	543	543

<sup>1</sup> Person Year Equivalents

# Significant at 90 Percent

\* Significant at 95 Percent

\*\* Significant at 99 Percent



TABLE 6-1

## THERAPEUTIC DRUG CATEGORIES COMPRISING TOP 50 PERCENT OF UTILIZATION AND EXPENDITURES

Therapeutic Class	HICL	Specific Drugs Covered
Act on Joints	S2	colchicine; anti-inflammatory agents; gold salts
Act on Skin	L0	topical, mucous membrane, subcutaneous enzyme preparations
Adrenergics	J5	catecholamines; aromatic non-catecholamines; beta-adrenergic agents; sympathomimetics
Analgesics	H3	narcotics; non-narcotics; salicylates; non-salicylates; anti-migraine preparations; narcotic antagonists
Antibiotics	W1	aminoglycosides; anti-tubercular agents; penicillins; polymixin; vancomycin; oxabeta lactams; beta-lactamase inhibitors
Anticonvulsants	H4	anticonvulsants
Antihistamine/Serotonin Drugs	Z2	antiserotonin; H2-inhibitors; immunosuppressives; chromolyn; immunomodulators; enzyme inhibitors
Calcium Antagonists	A9	calcium-channel blocking agents
Cardiac Stimulants	A1	digitalis glycosides; xanthines; inotropic agents; bronchodilators
Hypoglycemics	C4	insulins; sulfonylurea and non-sulfonylurea oral hypoglycemics
Hypotensives	A4	ACE inhibitors; veratrum alkaloids, vasodilators; sympatholytics; ganglionic blocking agents
Kidney/Urinary Tract Agents	R1	urinary PH modifiers; renal competitors; renal function diagnostic agents; diuretics; carbonic anhydrase inhibitors; uricosuric agents
Psychoactives	H2	anti-anxiety; anti-psychotics; MAO inhibitors; anti-depressants; antimania agents; anti-narcolepsy agents; anti-attention deficit disorder agents; antipruritics; CNS stimulants; general anesthetics; barbiturate and non-barbiturate sedative-hypnotics
Trachea/Bronchi Agents	B3	mucolytics; expectorants; cough and cold preparations; respiratory tract radio-opaque diagnostics

SOURCE: Medical Statistical Information System (MSIS).





TABLE 6-2

## UTILIZATION OF MOST COMMON (TOP 50%) PRESCRIPTION DRUGS, 1992: EIGHT STATES

Alabama	California	Delaware	Georgia	Kentucky	Missouri	New Jersey	Wisconsin
Psychoactives	Antibiotics	Antibiotics	Antibiotics	Antibiotics	Psychoactives	Psychoactives	Antibiotics
Antibiotics	Psychoactives	Psychoactives	Psychoactives	Psychoactives	Antibiotics	Antibiotics	Psychoactives
Analgesics	Analgesics	Analgesics	Analgesics	Antihistamine/ serotonin Drugs	Analgesics	Skin Drugs	Analgesics
Kidney/Urinary Tract Drugs	Trachea/ Bronchi Drugs	Trachea/ Bronchi Drugs	Kidney/Urinary Tract Drugs	Analgesics	Antihistamine/ serotonin Drugs	Trachea/ Bronchi Drugs	Antihistamine/ serotonin Drugs
Joint Drugs	Joint Drugs	Skin Drugs	Hypotensives	Kidney/Urinary Tract Drugs	Kidney/Urinary Tract Drugs	Antihistamine/ serotonin Drugs	Trachea/Bronchi Drugs
Hypotensives	Antihistamine/ serotonin Drugs	Antihistamine/ serotonin Drugs	Joint Drugs	Joint Drugs	Skin Drugs	Joint Drugs	Joint Drugs
Cardiac Stimulants	Adrenergics	Joint Drugs	Skin Drugs	Cardiac Stimulants	Joint Drugs	Vitamins	Kidney, Urinary Tract Drugs
Antihistamine/ serotonin Drugs			Calcium Antagonists		Cardiac Stimulants	Analgesics	

SOURCE: Medicaid Statistical Information System (MSIS).



TABLE 6-3

## EXPENDITURES OF MOST COMMON (TOP 50%) PRESCRIPTION DRUGS, 1992: EIGHT STATES

Alabama	California	Delaware	Georgia	Kentucky	Missouri	New Jersey	Wisconsin
Antibiotics	Psychoactives	Psychoactives	Antibiotics	Antihistamine/ serotonin Drugs	Antihistamine/ serotonin Drugs	Psychoactives	Antibiotics
Antihistamine/ serotonin Drugs	Antihistamine/ serotonin Drugs	Antibiotics	Calcium Antagonists	Antibiotics	Psychoactives	Antihistamine/ serotonin Drugs	Psychoactives
Psychoactives	Calcium Antagonists	Antihistamine/ serotonin Drugs	Psychoactives	Psychoactives	Antibiotics	Antibiotics	Antihistamine/ serotonin Drugs
Joint Drugs	Joint Drugs	Calcium Antagonists	Hypotensives	Calcium Antagonists	Calcium Antagonists	Calcium Antagonists	Joint Drugs
Calcium Antagonists	Antibiotics	Joint Drugs	Antihistamine/ serotonin Drugs	Joint Drugs	Joint Drugs	Joint Drugs	Anticonvulsants
Hypotensives	Hypotensives	Anticonvulsants	Hypoglycemics	Hypotensives	Hypotensives	Skin Drug	Hypotensives
	Hypoglycemics	Hypotensives	Joint Drugs			Hypotensives	

SOURCE: Medicaid Statistical Information System (MSIS).



TABLE 6-4

## UTILIZATION AND EXPENDITURES FOR ANTIBIOTIC PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
Total No. Rxs	622,912	4,815,544	73,466	1,224,947	1,049,386	841,464	948,597	50,519
Rxs/PYE <sup>1</sup>	1.71	1.52	1.59	1.82	2.34	1.92	1.76	1.76
Rxs/User	2.60	2.40	2.52	2.57	3.14	2.70	2.56	2.29
Total Expenditures (\$) <sup>2</sup>	13,775	61,458	1,729	26,018	18,963	17,478	24,496	1,067
Expenditures/PYE <sup>1</sup> (\$)	37.89	19.42	37.45	38.56	42.23	39.85	45.35	37.18
Expenditures/User (\$)	57.44	30.69	48.28	54.50	56.74	55.11	66.08	48.34
Expenditures/Rx (\$)	22.11	12.76	19.12	21.24	18.07	20.77	25.82	21.12
Utilization Rank (% of Total) <sup>3</sup>	2 (10.43)	1 (13.06)	1 (13.54)	1 (13.17)	1 (12.79)	2 (10.92)	2 (10.89)	1 (16.57)
Expenditures Rank (% of Total) <sup>3</sup>	1 (10.85)	5 (7.59)	2 (13.47)	1 (13.99)	2 (11.30)	3 (10.79)	3 (10.16)	1 (14.94)

## NOTES:

<sup>1</sup> Person Year Equivalents<sup>2</sup> In Thousands<sup>3</sup> The rank and percentage numbers are based only on the non-missing therapeutic categories.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 6-5

## UTILIZATION AND EXPENDITURES FOR PSYCHOACTIVE PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
Total No. Rxs	669,230	3,486,315	69,845	931,753	989,918	1,010,689	1,124,761	37,337
Rxs/PYE <sup>1</sup>	1.84	1.10	1.51	1.38	2.20	2.30	2.08	1.30
Rxs/User	6.42	6.20	7.24	4.95	7.27	8.61	7.57	5.97
Total Expenditures (\$) <sup>2</sup>	11,311	75,527	1,729	16,156	17,057	19,173	29,145	920
Expenditures/PYE <sup>1</sup> (\$)	31.10	23.87	37.45	23.95	37.98	43.72	53.96	32.05
Expenditures/User (\$)	108.46	134.50	179.25	85.89	125.28	163.27	196.15	147.20
Expenditures/Rx (\$)	16.90	21.66	24.75	17.34	17.23	18.97	25.91	24.64
Utilization Rank (% of Total) <sup>3</sup>	1 (11.20)	2 (9.46)	2 (12.87)	2 (10.02)	2 (12.07)	1 (13.11)	1 (12.91)	2 (12.25)
Expenditures Rank (% of Total) <sup>3</sup>	3 (8.91)	1 (9.33)	1 (13.47)	3 (8.69)	3 (10.17)	2 (11.84)	1 (12.09)	2 (12.88)

## NOTES:

<sup>1</sup> Person Year Equivalents<sup>2</sup> In Thousands<sup>3</sup> The rank and percentage numbers are based only on the non-missing therapeutic categories.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-6

## UTILIZATION AND EXPENDITURES FOR PRESCRIPTION DRUGS THAT ACT ON JOINTS IN EIGHT STATE MEDICAID PROGRAMS, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
Total No. Rxs	304,906	1,596,561	22,186	421,539	362,386	282,513	412,343	11,799
Rxs/PYE <sup>1</sup>	0.84	0.50	0.48	0.62	0.81	0.64	0.76	0.41
Rxs/User	3.35	3.41	2.48	2.64	3.55	3.14	2.60	2.51
Total Expenditures (\$) <sup>2</sup>	10,380	62,957	618	7,192	8,805	8,400	12,684	385
Expenditures/PYE <sup>1</sup> (\$)	28.55	19.90	13.38	10.66	19.61	19.15	23.48	13.43
Expenditures/User (\$)	113.94	134.29	69.20	45.02	86.32	93.27	80.08	81.86
Expenditures/Rx (\$)	34.04	39.43	27.85	17.06	24.30	29.73	30.76	32.66
Utilization Rank (% of Total) <sup>3</sup>	5 (5.10)	5 (4.33)	7 (4.09)	6 (4.53)	6 (4.42)	7 (3.67)	6 (4.73)	6 (3.66)
Expenditures Rank (% of Total) <sup>3</sup>	4 (8.17)	4 (7.78)	5 (4.81)	7 (3.87)	5 (5.25)	5 (5.19)	5 (5.26)	4 (5.39)

## NOTES:

<sup>1</sup> Person Year Equivalents<sup>2</sup> In Thousands<sup>3</sup> The rank and percentage numbers are based only on the non-missing therapeutic categories.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 6-7

## UTILIZATION AND EXPENDITURES FOR CALCIUM ANTAGONIST PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
Total No. Rxs	226,515	1,264,365	15,116	381,347	232,292	231,486	252,806	4,879
Rxs/PYE <sup>1</sup>	0.62	0.40	0.33	0.57	0.52	0.53	0.47	0.17
Rxs/User	6.74	5.37	6.26	6.73	7.23	7.04	5.94	6.05
Total Expenditures (\$) <sup>2</sup>	9,270	66,507	764	16,314	10,132	9,863	13,503	207
Expenditures/PYE <sup>1</sup> (\$)	25.50	21.02	16.54	24.18	22.58	22.49	25.00	7.22
Expenditures/User (\$)	275.72	282.36	316.08	287.71	315.36	300.01	317.00	256.90
Expenditures/Rx (\$)	40.92	52.60	50.52	42.78	43.62	42.61	53.41	42.49
Utilization Rank (% of Total) <sup>3</sup>	10 (3.80)	8 (3.43)	13 (2.78)	8 (4.10)	11 (2.83)	11 (3.00)	13 (2.90)	21 (1.60)
Expenditures Rank (% of Total) <sup>3</sup>	5 (7.30)	3 (8.22)	4 (5.95)	2 (8.77)	4 (6.04)	4 (6.09)	4 (5.60)	8 (2.90)

## NOTES:

<sup>1</sup> Person Year Equivalents<sup>2</sup> In Thousands<sup>3</sup> The rank and percentage numbers are based only on the non-missing therapeutic categories.

Bold and italicized numbers imply that the drug category did not fall among those explaining the top 50 percent of utilization or spending for the state. We still reported the numbers for completeness of the table.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-8

## UTILIZATION AND EXPENDITURES FOR ANTIHISTAMINE/SEROTONIN PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
Total No. Rxs	252,316	1,411,072	24,106	293,964	623,569	399,432	418,543	14,418
Rxs/PYE <sup>1</sup>	0.69	0.45	0.52	<b>0.44</b>	1.39	0.91	0.77	0.50
Rxs/User	3.78	3.09	3.24	<b>2.23</b>	3.88	3.83	3.31	3.27
Total Expenditures (\$) <sup>2</sup>	12,986	70,339	1,313	11,386	23,381	19,285	24,906	825
Expenditures/PYE <sup>1</sup> (\$)	35.72	22.23	28.44	16.88	52.06	43.97	46.11	28.75
Expenditures/User (\$)	194.78	153.81	176.44	86.24	145.59	184.97	197.22	187.21
Expenditures/Rx (\$)	51.47	49.85	54.48	38.73	37.50	48.28	59.51	57.22
Utilization Rank (% of Total) <sup>3</sup>	8 (4.22)	6 (3.83)	6 (4.44)	<b>11 (3.16)</b>	3 (7.60)	4 (5.18)	5 (4.81)	4 (4.73)
Expenditures Rank (% of Total) <sup>3</sup>	2 (10.22)	2 (8.69)	3 (10.23)	5 (6.12)	1 (1.39)	1 (11.91)	2 (10.33)	3 (11.55)

## NOTES:

<sup>1</sup> Person Year Equivalents<sup>2</sup> In Thousands<sup>3</sup> The rank and percentage numbers are based only on the non-missing therapeutic categories. Bold and italicized numbers imply that the drug category did not fall among those explaining the top 50 percent of utilization or spending for the state. We still reported the numbers for completeness of the table.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-9

## UTILIZATION AND EXPENDITURES FOR ANALGESIC PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
Total No. Rx's	448,503	3,249,493	33,986	638,008	592,079	479,997	329,284	17,175
Rxs/PYE <sup>1</sup>	1.23	1.03	0.74	0.95	1.32	1.09	0.61	0.60
Rxs/User	4.38	3.24	3.34	3.33	4.95	3.74	3.57	2.68
Total Expenditures (\$) <sup>2</sup>	<b>5,079</b>	<b>27,796</b>	<b>387</b>	<b>6,972</b>	<b>4,959</b>	<b>4,724</b>	<b>5,045</b>	<b>190</b>
Expenditures/PYE <sup>1</sup> (\$)	<b>13.97</b>	<b>8.79</b>	<b>8.40</b>	<b>10.34</b>	<b>11.04</b>	<b>10.77</b>	<b>9.34</b>	<b>6.65</b>
Expenditures/User (\$)	<b>49.59</b>	<b>27.69</b>	<b>38.10</b>	<b>36.36</b>	<b>41.43</b>	<b>36.84</b>	<b>54.73</b>	<b>29.82</b>
Expenditures/Rx (\$)	<b>11.32</b>	<b>8.55</b>	<b>11.44</b>	<b>10.92</b>	<b>8.38</b>	<b>9.94</b>	<b>15.22</b>	<b>11.12</b>
Utilization Rank (% of Total) <sup>3</sup>	3 (7.51)	3 (8.82)	3 (6.26)	3 (6.86)	4 (7.22)	3 (6.23)	8 (3.78)	3 (5.63)
Expenditures Rank (% of Total) <sup>3</sup>	<b>8 (4.00)</b>	<b>10 (3.44)</b>	<b>11 (3.02)</b>	<b>8 (3.75)</b>	<b>10 (2.96)</b>	<b>9 (2.92)</b>	<b>14 (2.09)</b>	<b>9 (2.67)</b>

## NOTES:

<sup>1</sup> Person Year Equivalents<sup>2</sup> In Thousands<sup>3</sup> The rank and percentage numbers are based only on the non-missing therapeutic categories.

Bold and italicized numbers imply that the drug category did not fall among those explaining the top 50 percent of utilization or spending for the state. We still reported the numbers for completeness of the table.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 6-10

## UTILIZATION AND EXPENDITURES FOR HYPOTENSIVE PRESCRIPTION DRUGS IN EIGHT STATE MEDICAID PROGRAMS, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
Total No. Rxs	299,966	<b>1,175,199</b>	<b>13,778</b>	427,505	<b>239,429</b>	<b>253,789</b>	<b>224,833</b>	<b>7,485</b>
Rxs/PYE <sup>1</sup>	0.83	<b>0.37</b>	<b>0.30</b>	0.63	<b>0.53</b>	<b>0.58</b>	<b>0.42</b>	<b>0.26</b>
Rxs/User	7.44	<b>5.35</b>	<b>6.35</b>	7.25	<b>7.55</b>	<b>7.44</b>	<b>6.08</b>	<b>6.22</b>
Total Expenditures (\$) <sup>2</sup>	7,810	44,964	492	12,263	7,210	7,538	8,439	269
Expenditures/PYE <sup>1</sup> (\$)	21.48	14.21	10.67	18.18	16.05	17.19	15.62	9.38
Expenditures/User (\$)	193.83	204.82	227.02	207.98	227.43	221.06	228.12	223.78
Expenditures/Rx (\$)	26.04	38.26	35.74	28.68	30.11	29.70	37.53	35.97
Utilization Rank (% of Total) <sup>3</sup>	6 (5.02)	<b>9 (3.19)</b>	<b>15 (2.54)</b>	5 (4.60)	<b>10 (2.92)</b>	<b>10 (3.29)</b>	<b>15 (2.58)</b>	<b>13 (2.46)</b>
Expenditures Rank (% of Total) <sup>3</sup>	6 (6.15)	6 (5.55)	7 (3.84)	4 (6.60)	6 (4.30)	6 (4.65)	7 (3.50)	6 (3.77)

## NOTES:

<sup>1</sup> Person Year Equivalents<sup>2</sup> In Thousands<sup>3</sup> The rank and percentage numbers are based only on the non-missing therapeutic categories.

Bold and italicized numbers imply that the drug category did not fall among those explaining the top 50 percent of utilization or spending for the state. We still reported the numbers for completeness of the table.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-11

## ANTIBIOTIC UTILIZATION PER PYE\* BY ELIGIBILITY GROUP ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Categorically Needy (Cash)</b>								
Aged	--	1.22	--	--	--	--	--	--
Blind & Disabled	1.77	1.62	1.63	1.67	2.67	2.03	1.85	1.64
Child	1.43	1.76	1.52	1.74	2.27	1.72	1.72	1.76
Adult	1.56	1.55	1.42	1.70	2.16	1.64	1.86	1.40
Other	--	--	--	--	--	--	--	--
<b>Categorically Needy (Non-Cash)</b>								
Aged	--	0.82	1.51	--	--	--	1.92	--
Blind & Disabled	1.73	1.36	1.41	--	--	2.03	2.01	1.50
Child	1.65	1.13	1.73	2.10	2.15	2.07	1.79	2.30
Adult	1.64	0.70	1.39	1.78	1.89	1.70	1.59	1.31
Other	1.13	0.30	--	--	--	2.67	--	1.82
<b>Medically Needy</b>								
Aged	N/A	1.32	N/A	1.47	--	N/A	--	N/A
Blind & Disabled	N/A	1.47	N/A	1.97	2.51	N/A	0.00	N/A
Child	N/A	1.73	N/A	2.19	2.35	N/A	1.50	N/A
Adult	N/A	1.14	N/A	0.72	1.91	N/A	--	N/A
Other	N/A	--	N/A	2.24	--	N/A	--	N/A
<b>Expansion Group (Prior to 1988)</b>								
Aged	N/A	--	--	--	--	--	--	N/A
Blind & Disabled	N/A	--	2.53	2.07	--	--	1.98	N/A
Child	N/A	2.23	1.68	1.32	2.67	1.80	1.97	N/A
Adult	N/A	0.49	0.64	5.45	1.63	1.10	0.64	N/A
Other	N/A	--	0.78	1.03	--	--	--	N/A
<b>Expansion Group (1988 and After)</b>								
Aged	0.10	1.44	0.02	0.10	--	0.46	--	N/A
Blind & Disabled	--	--	0.11	--	0.13	--	--	N/A
Child	1.41	1.90	2.51	3.04	3.19	2.53	2.29	N/A
Adult	1.44	1.14	0.85	1.44	1.42	2.02	0.94	N/A
Other	--	--	--	--	--	--	--	N/A
Unknown	--	--	--	--	--	--	--	--

## NOTES:

\* Person Year Equivalents

A "--" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 6-12

## PSYCHOACTIVE UTILIZATION PER PYE\* BY ELIGIBILITY GROUP ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Categorically Needy (Cash)</b>								
Aged	2.35	1.16	2.54	1.55	2.69	3.89	2.55	2.64
Blind & Disabled	4.39	4.07	5.85	3.88	4.97	7.17	6.51	4.51
Child	—	—	—	—	—	—	—	0.32
Adult	1.09	0.64	1.09	0.84	1.39	1.20	1.24	1.22
Other	—	—	—	—	—	—	—	—
<b>Categorically Needy (Non-Cash)</b>								
Aged	6.44	0.96	1.35	—	11.77	5.85	5.25	5.84
Blind & Disabled	6.17	3.96	6.35	—	15.54	7.80	9.15	4.65
Child	—	—	—	—	—	0.43	—	—
Adult	0.66	0.20	0.86	0.69	0.92	0.99	0.79	—
Other	1.16	—	—	—	—	—	—	2.76
<b>Medically Needy</b>								
Aged	N/A	2.72	N/A	2.09	12.16	N/A	—	N/A
Blind & Disabled	N/A	4.12	N/A	3.57	6.71	N/A	—	N/A
Child	N/A	—	N/A	0.73	—	N/A	0.42	N/A
Adult	N/A	0.41	N/A	0.37	1.02	N/A	—	N/A
Other	N/A	—	N/A	0.69	—	N/A	—	N/A
<b>Expansion Group (Prior to 1988)</b>								
Aged	N/A	—	4.92	5.34	13.13	9.60	2.76	N/A
Blind & Disabled	N/A	—	3.52	5.98	17.92	7.31	8.66	N/A
Child	N/A	—	—	0.41	—	2.86	—	N/A
Adult	N/A	—	0.37	—	—	—	—	N/A
Other	N/A	—	0.78	0.57	—	—	—	N/A
<b>Expansion Group (1988 and After)</b>								
Aged	0.19	3.22	0.10	0.19	0.15	1.27	—	N/A
Blind & Disabled	—	—	0.17	—	0.25	—	—	N/A
Child	—	—	—	—	—	—	—	N/A
Adult	—	0.32	—	—	—	—	—	N/A
Other	—	—	—	—	—	—	—	N/A
<b>Unknown</b>	—	—	—	—	—	—	—	—

## NOTES:

\* Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-13

## ANALGESIC UTILIZATION PER PYE\* BY ELIGIBILITY GROUP ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Categorically Needy (Cash)</b>								
Aged	1.92	1.49	1.43	1.67	1.90	2.21	—	1.36
Blind & Disabled	2.57	2.31	1.86	2.00	2.41	2.28	1.45	1.26
Child	1.43	—	—	—	—	—	—	—
Adult	1.56	1.55	1.22	1.55	1.53	1.23	0.94	1.03
Other	—	—	—	—	—	—	—	—
<b>Categorically Needy (Non-Cash)</b>								
Aged	2.96	1.10	—	—	8.32	3.24	—	2.33
Blind & Disabled	2.15	2.08	1.71	—	4.43	2.38	1.22	1.10
Child	—	—	—	—	—	—	—	—
Adult	1.22	—	1.00	1.42	1.01	1.04	0.80	0.75
Other	—	0.15	—	—	—	—	—	—
<b>Medically Needy</b>								
Aged	N/A	1.15	N/A	2.32	8.22	N/A	—	N/A
Blind & Disabled	N/A	1.89	N/A	3.58	3.52	N/A	—	N/A
Child	N/A	—	N/A	—	—	N/A	—	N/A
Adult	N/A	0.92	N/A	0.87	1.16	N/A	—	N/A
Other	N/A	—	N/A	—	—	N/A	—	N/A
<b>Expansion Group (Prior to 1988)</b>								
Aged	N/A	—	1.83	2.57	9.33	—	—	N/A
Blind & Disabled	N/A	—	0.97	2.62	5.11	—	2.31	N/A
Child	N/A	—	—	—	—	—	—	N/A
Adult	N/A	0.35	0.41	4.36	—	—	—	N/A
Other	N/A	—	—	—	—	—	—	N/A
<b>Expansion Group (1988 and After)</b>								
Aged	0.15	1.47	0.03	0.15	0.12	0.61	—	N/A
Blind & Disabled	—	—	0.15	—	0.15	—	—	N/A
Child	—	—	—	—	—	—	—	N/A
Adult	0.98	0.79	0.49	0.98	—	0.51	0.30	N/A
Other	—	—	—	—	—	—	—	N/A
Unknown	—	—	—	—	—	—	—	—

## NOTES:

\* Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-14

ANTIBIOTIC UTILIZATION PER PYE<sup>1</sup> BY DEMOGRAPHICS ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Age</b>								
Under age 1	2.35	2.10	2.05	2.86	2.24	2.03	1.97	1.79
1-5	2.38	2.23	2.43	2.71	3.28	2.55	2.38	2.66
6-18	1.18	1.21	1.06	1.31	1.88	1.42	1.34	1.33
19-44	1.47	1.29	1.40	1.66	2.14	1.68	1.76	1.42
45-64	1.89	1.75	1.55	—	2.76	2.11	1.88	1.41
65-74	—	1.42	—	—	2.00	—	1.43	1.45
75+	—	1.24	—	—	—	—	—	—
Unknown	1.28	0.78	N/A	N/A	—	N/A	N/A	1.33
<b>Gender</b>								
Female	1.68	1.48	1.54	1.75	2.34	1.91	1.77	1.71
Male	1.77	1.59	1.67	1.93	2.33	1.94	1.74	1.85
Unknown	1.40	—	1.04	2.97	—	N/A	N/A	N/A
<b>Race/Ethnicity</b>								
White	2.2 <sup>1</sup>	1.46	2.02	2.39	2.49	2.26	1.89	1.89
Black	1.33	1.39	1.26	1.45	1.28	1.17	1.50	1.30
Hispanic	1.62	1.46	1.56	1.84	1.72	N/A	2.10	1.69
Other	1.49	2.00	1.08	2.43	1.42	1.82	1.73	0.98
Unknown	1.78	1.59	1.83	1.68	2.61	N/A	1.61	1.39
<b>Residence</b>								
Major urban	1.16	1.57	N/A	1.18	1.54	1.43	1.71	N/A
Other urban	1.70	1.37	1.57	1.81	2.02	1.67	1.82	N/A
Rural	1.91	1.34	1.63	2.08	2.61	2.42	N/A	N/A
Unknown	0.80	N/A	1.37	N/A	—	1.99	—	1.76

## NOTES:

<sup>1</sup> Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 6-15

## PSYCHOACTIVE UTILIZATION PER PYE\* BY DEMOGRAPHICS ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Age</b>								
Under age 1	--	--	--	--	--	--	--	--
1-5	--	--	--	--	--	--	--	--
6-18	1.18	--	0.43	0.55	0.57	0.60	0.50	0.62
19-44	2.27	1.42	2.45	1.69	2.46	2.82	2.90	1.67
45-64	5.20	3.53	5.65	3.96	5.37	7.27	6.33	4.31
65-74	3.38	1.82	3.52	2.72	4.45	5.71	4.07	4.81
75+	3.39	1.92	3.50	2.90	6.11	4.52	4.03	4.95
Unknown	--	0.72	N/A	N/A	6.99	N/A	N/A	2.00
<b>Gender</b>								
Female	2.05	1.08	1.65	1.45	2.39	2.43	2.13	1.36
Male	1.48	1.13	1.28	1.25	1.90	2.09	2.00	1.20
Unknown	--	3.43	--	1.95	--	N/A	N/A	N/A
<b>Race/Ethnicity</b>								
White	2.66	1.74	2.55	2.06	2.28	2.91	3.89	1.48
Black	1.02	0.97	0.78	0.84	1.06	0.95	0.99	0.85
Hispanic	0.80	--	0.81	0.41	0.57	N/A	--	0.57
Other	0.75	0.43	1.45	0.86	0.47	1.51	0.83	0.38
Unknown	3.82	2.23	1.94	2.94	4.06	N/A	3.61	2.70
<b>Residence</b>								
Major urban	1.65	1.13	N/A	0.86	2.00	2.10	1.86	N/A
Other urban	1.75	1.02	1.59	1.39	2.01	2.02	2.39	N/A
Rural	2.01	0.94	1.31	1.58	2.20	2.68	N/A	N/A
Unknown	0.61	N/A	0.46	N/A	12.93	3.00	--	1.30

## NOTES:

\* Person Year Equivalents

A "--" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-16

ANALGESIC UTILIZATION PER PYE<sup>1</sup> BY DEMOGRAPHICS ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Age</b>								
Under age 1	—	—	—	—	—	—	—	—
1-5	—	—	—	—	—	—	—	—
6-18	—	0.45	—	—	—	—	—	—
19-44	1.72	1.27	1.23	1.51	1.54	1.32	0.96	0.95
45-64	3.46	2.82	2.40	2.54	3.01	2.80	1.89	1.83
65-74	2.41	1.92	1.71	2.00	2.75	2.67	—	1.97
75+	2.22	1.43	1.49	1.97	4.49	—	—	2.03
Unknown	—	—	N/A	N/A	5.73	N/A	N/A	—
<b>Gender</b>								
Female	1.48	1.10	0.90	1.14	1.53	1.31	0.75	0.75
Male	0.80	0.90	0.45	0.58	0.97	0.73	—	—
Unknown	—	—	0.99	2.87	—	N/A	N/A	N/A
<b>Race/Ethnicity</b>								
White	1.66	1.00	1.04	1.32	1.36	1.31	0.94	0.6
Black	0.76	1.23	0.51	0.63	0.68	0.61	—	0.46
Hispanic	0.49	0.37	0.62	—	—	N/A	—	0.34
Other	0.69	1.68	—	—	—	—	—	0.24
Unknown	2.75	1.96	0.87	2.04	2.38	N/A	0.98	1.16
<b>Residence</b>								
Major urban	0.91	1.08	N/A	0.48	1.10	0.93	—	N/A
Other urban	1.18	0.85	0.76	0.91	1.08	0.93	0.70	N/A
Rural	1.40	0.81	0.68	1.17	1.43	1.34	N/A	N/A
Unknown	—	N/A	—	N/A	2.34	1.16	—	0.60

## NOTES:

<sup>1</sup> Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 6-17

## ANTI-HISTAMINE/SEROTONIN EXPENDITURES PER PYE\* BY ELIGIBILITY GROUP ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Categorically Needy (Cash)</b>								
Aged	73.03	55.86	82.54	29.16	107.23	110.63	117.08	117.79
Blind & Disabled	78.69	60.31	96.50	42.17	122.72	111.98	113.27	81.71
Child	—	—	—	—	7.31	5.77	—	—
Adult	20.93	13.29	18.64	12.08	44.47	24.63	34.47	27.05
Other	—	—	—	—	—	—	—	—
<b>Categorically Needy (Non-Cash)</b>								
Aged	115.89	42.65	78.55	—	171.57	132.53	128.69	165.26
Blind & Disabled	83.82	94.42	106.33	—	161.82	125.18	123.78	63.44
Child	—	1.91	6.25	—	5.85	9.20	—	—
Adult	11.69	4.81	21.60	12.26	29.91	22.02	26.98	10.12
Other	—	2.15	—	—	—	—	—	18.84
<b>Medically Needy</b>								
Aged	N/A	63.53	N/A	75.09	179.87	N/A	—	N/A
Blind & Disabled	N/A	106.20	N/A	198.50	208.66	N/A	—	N/A
Child	N/A	—	N/A	15.35	7.33	N/A	15.42	N/A
Adult	N/A	12.59	N/A	13.23	35.86	N/A	—	N/A
Other	N/A	—	N/A	15.68	—	N/A	—	N/A
<b>Expansion Group (Prior to 1988)</b>								
Aged	N/A	—	85.41	45.67	186.86	—	121.67	N/A
Blind & Disabled	N/A	—	81.27	76.98	173.38	—	164.69	N/A
Child	N/A	—	10.01	—	6.64	16.52	—	N/A
Adult	N/A	—	—	—	—	—	—	N/A
Other	N/A	—	6.91	—	—	—	—	N/A
<b>Expansion Group (1988 and After)</b>								
Aged	3.25	72.53	0.83	4.68	4.15	35.74	—	N/A
Blind & Disabled	—	—	5.91	—	9.48	—	—	N/A
Child	—	—	—	—	—	—	—	N/A
Adult	—	9.92	4.48	—	—	—	3.88	N/A
Other	—	—	—	—	—	—	—	N/A
<b>Unknown</b>	—	—	—	—	—	—	—	—

## NOTES:

\* Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-18

## ANTIBIOTIC EXPENDITURES PER PYE\* BY ELIGIBILITY GROUP ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Categorically Needy (Cash)</b>								
Aged	37.03	—	—	35.37	36.82	40.74	—	35.60
Blind & Disabled	46.97	—	47.24	47.30	53.97	54.57	66.61	51.61
Child	26.87	18.84	22.97	30.28	33.37	27.52	31.91	31.32
Adult	31.54	13.48	27.23	33.61	31.98	30.31	50.05	29.83
Other	—	—	—	—	—	—	—	—
<b>Categorically Needy (Non-Cash)</b>								
Aged	73.97	—	49.87	—	119.34	64.41	75.69	78.90
Blind & Disabled	57.59	—	—	—	100.47	63.06	94.61	42.93
Child	29.93	12.56	27.81	37.34	31.94	34.98	32.20	40.62
Adult	28.89	6.25	25.47	35.23	26.38	31.70	39.04	24.87
Other	21.04	3.14	—	—	—	26.67	—	31.52
<b>Medically Needy</b>								
Aged	N/A	33.90	N/A	47.33	125.64	N/A	—	N/A
Blind & Disabled	N/A	41.26	N/A	112.83	91.75	N/A	0.21	N/A
Child	N/A	18.47	N/A	52.92	35.49	N/A	36.00	N/A
Adult	N/A	10.68	N/A	12.19	28.06	N/A	—	N/A
Other	N/A	—	N/A	45.29	—	N/A	—	N/A
<b>Expansion Group (Prior to 1988)</b>								
Aged	N/A	—	53.78	75.56	120.72	—	—	N/A
Blind & Disabled	N/A	—	66.98	79.71	127.20	—	78.73	N/A
Child	N/A	23.64	29.10	26.09	41.41	32.09	37.89	N/A
Adult	N/A	3.98	7.91	104.73	19.07	15.32	9.75	N/A
Other	N/A	—	22.76	17.60	—	—	—	N/A
<b>Expansion Group (1988 and After)</b>								
Aged	1.70	32.95	0.69	3.71	1.69	14.80	—	N/A
Blind & Disabled	—	—	—	—	6.96	—	—	N/A
Child	44.65	22.95	36.73	52.24	51.34	41.69	37.01	N/A
Adult	19.28	9.83	12.38	23.35	16.95	27.12	17.09	N/A
Other	—	—	—	—	—	—	—	N/A
<b>Unknown</b>	—	—	—	—	—	—	—	—

## NOTES:

\* Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-19

## PSYCHOACTIVE EXPENDITURES PER PYE\* BY ELIGIBILITY GROUP ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Categorically Needy (Cash)</b>								
Aged	—	—	48.62	—	—	51.62	56.71	55.36
Blind & Disabled	81.18	103.43	175.62	73.76	96.94	155.20	199.31	134.07
Child	—	—	—	—	—	—	—	6.40
Adult	17.39	10.45	24.84	15.49	26.44	24.74	30.36	39.31
Other	—	—	—	—	—	—	—	—
<b>Categorically Needy (Non-Cash)</b>								
Aged	103.60	—	—	—	167.26	85.20	95.73	98.16
Blind & Disabled	100.44	111.28	228.78	—	244.85	176.76	189.46	124.34
Child	—	—	—	—	—	—	—	—
Adult	—	3.23	18.75	12.50	16.01	20.09	19.49	11.16
Other	24.40	—	—	—	—	—	—	59.77
<b>Medically Needy</b>								
Aged	N/A	37.20	N/A	—	180.81	N/A	—	N/A
Blind & Disabled	N/A	100.36	N/A	146.02	134.00	N/A	—	N/A
Child	N/A	3.20	N/A	—	—	N/A	—	N/A
Adult	N/A	6.96	N/A	—	20.21	N/A	—	N/A
Other	N/A	—	N/A	14.42	—	N/A	—	N/A
<b>Expansion Group (Prior to 1988)</b>								
Aged	N/A	—	84.22	86.80	187.81	141.90	60.64	N/A
Blind & Disabled	N/A	—	60.21	105.32	237.59	—	319.70	N/A
Child	N/A	—	—	6.29	—	42.01	—	N/A
Adult	N/A	—	—	—	—	—	—	N/A
Other	N/A	—	23.35	10.74	—	—	—	N/A
<b>Expansion Group (1988 and After)</b>								
Aged	2.58	56.22	1.73	3.96	2.24	27.52	—	N/A
Blind & Disabled	—	—	3.69	—	6.96	—	—	N/A
Child	—	—	—	—	—	—	—	N/A
Adult	—	6.13	—	—	—	—	—	N/A
Other	—	—	—	—	—	—	—	N/A
<b>Unknown</b>	—	—	—	—	—	—	—	—

## NOTES:

\* Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 6-20

## ANTI-HISTAMINE/SEROTONIN DRUG EXPENDITURES PER PYE\* BY DEMOGRAPHICS ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Age</b>								
Under age 1	—	—	—	—	—	—	—	—
1-5	—	—	—	—	—	—	—	—
6-18	—	3.33	7.85	6.67	8.95	8.91	9.95	7.41
19-44	32.58	17.56	35.63	18.59	52.06	38.87	46.14	28.65
45-64	99.51	65.23	107.43	48.32	153.54	146.44	132.00	98.90
65-74	82.03	63.52	98.86	34.40	122.82	130.78	126.45	157.94
75+	83.05	62.73	72.34	33.15	130.28	125.55	128.00	148.03
Unknown	—	—	N/A	N/A	108.39	N/A	N/A	—
<b>Gender</b>								
Female	40.68	22.68	31.14	17.24	55.18	47.16	50.84	31.97
Male	27.16	21.52	28.83	16.19	47.01	38.46	37.43	23.09
Unknown	—	144.86	—	—	43.30	N/A	N/A	N/A
<b>Race/Ethnicity</b>								
White	49.85	30.96	40.05	23.03	52.84	54.97	72.11	32.7
Black	20.12	16.91	18.22	11.07	21.19	19.48	26.91	14.05
Hispanic	15.71	5.36	23.05	—	7.30	N/A	20.97	14.00
Other	25.30	10.20	59.29	14.68	9.95	—	26.33	6.64
Unknown	83.50	55.23	73.26	43.50	127.13	N/A	97.45	61.97
<b>Residence</b>								
Major urban	26.57	23.00	N/A	11.97	30.71	31.24	43.77	N/A
Other urban	33.30	19.16	29.64	15.80	41.78	35.45	49.43	N/A
Rural	41.34	21.24	25.36	19.85	59.47	58.93	N/A	N/A
Unknown	—	N/A	13.92	N/A	88.35	51.52	—	28.75

## NOTES:

\* Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)



TABLE 6-21

ANTIBIOTIC EXPENDITURES PER PYE<sup>1</sup> BY DEMOGRAPHICS ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Age</b>								
Under age 1	32.58	20.45	21.64	37.82	30.49	24.07	23.50	23.51
1-5	43.80	26.56	36.84	47.04	53.09	39.99	39.97	47.76
6-18	24.51	11.38	19.78	25.60	27.29	26.09	29.93	25.15
19-44	31.88	13.22	30.44	35.48	34.51	36.92	31.94	32.13
45-64	--	--	--	49.59	58.01	60.13	70.76	44.74
65-74	--	--	--	39.64	--	55.52	--	49.65
75+	47.58	30.86	39.58	50.12	69.06	61.55	62.12	69.46
Unknown	16.33	--	N/A	N/A	99.84	N/A	N/A	N/A
<b>Gender</b>								
Female	37.72	18.15	29.97	37.51	41.84	39.32	45.69	36.48
Male	38.48	21.46	31.26	40.54	42.86	40.77	43.07	38.42
Unknown	18.34	--	--	93.33	--	N/A	N/A	--
<b>Race/Ethnicity</b>								
White	50.26	21.64	41.73	53.90	44.93	48.77	54.06	41.73
Black	27.46	15.89	21.80	27.97	21.85	19.97	35.45	21.94
Hispanic	28.54	15.60	27.86	31.63	25.99	N/A	47.30	30.53
Other	28.74	18.12	--	49.84	21.67	31.93	35.36	18.59
Unknown	47.55	27.54	39.51	46.94	51.76	N/A	53.98	39.03
<b>Residence</b>								
Major urban	23.71	19.83	N/A	22.80	28.52	28.87	43.67	--
Other urban	37.68	17.92	30.70	37.20	33.90	33.56	47.74	--
Rural	42.76	18.36	30.16	46.24	47.59	51.74	N/A	--
Unknown	12.07	N/A	22.59	N/A	60.91	43.71	--	37.19

## NOTES:

<sup>1</sup> Person Year Equivalents

A "--" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medical Statistical Information System (MSIS)



TABLE 6-22

PSYCHOACTIVE EXPENDITURES PER PYE<sup>1</sup> BY DEMOGRAPHICS ACROSS STATES, 1992

	AL	CA	DE	GA	KY	MO	NJ	WY
<b>Age</b>								
Under age 1	—	—	—	—	—	—	—	—
1-5	—	—	—	—	—	—	—	—
6-18	9.21	4.03	7.22	8.64	8.40	8.59	8.20	12.97
19-44	47.08	40.35	75.44	34.62	51.57	69.35	90.78	51.48
45-64	90.12	75.87	146.76	73.28	99.62	146.08	178.69	129.17
65-74	50.45	—	71.26	43.78	63.82	90.63	93.58	97.71
75+	47.38	—	60.88	43.21	83.25	74.40	77.05	78.83
Unknown	—	—	N/A	N/A	101.78	N/A	N/A	—
<b>Gender</b>								
Female	33.70	21.14	37.39	25.02	41.15	44.70	53.03	34.08
Male	26.82	28.23	37.59	21.94	32.84	42.02	55.65	28.49
Unknown	—	—	—	—	—	N/A	N/A	N/A
<b>Race/Ethnicity</b>								
White	45.56	40.51	65.96	37.92	38.48	54.89	104.58	36.71
Black	16.60	19.17	17.44	12.90	22.07	18.82	23.25	23.95
Hispanic	20.05	—	15.81	6.11	11.60	N/A	15.09	11.98
Other	15.04	—	29.82	—	7.83	—	14.92	7.52
Unknown	65.74	47.50	49.19	55.04	75.38	N/A	99.90	66.62
<b>Residence</b>								
Major urban	32.73	24.42	N/A	16.74	41.88	46.24	49.44	N/A
Other urban	30.08	22.15	42.01	24.88	36.55	40.32	60.37	N/A
Rural	31.71	21.41	23.92	26.07	35.84	45.57	N/A	N/A
Unknown	12.38	N/A	6.22	N/A	207.98	55.20	—	32.06

## NOTES:

<sup>1</sup> Person Year Equivalents

A "—" is used when the drug category is not among the list of top 50 percent drugs for the eligibility group.

N/A implies that there was no reported enrollment in the specific category.

SOURCE: Medicaid Statistical Information System (MSIS)





TABLE 7-1

## PHARMACY PRACTICE CHARACTERISTICS IN SELECTED STATES, 1992

Characteristic	Alabama	California	Delaware	Georgia	Kentucky	Missouri <sup>1</sup>	New Jersey	Wyoming
Pharmacies/State	—	6,000	149	2,100	1,300	UNK	1,850	130
Medicaid Pharmacies	1,352	6,000	129	1,825	2139 <sup>2</sup>	UNK	1,830	130
Pharmacy Coverage by MAS/BOE	CN and MN	CN and MN	CN	CN and most MN	CN and most MN	CN	CN and most MN	CN
OTC Reimbursement	NO	Require written Rx	Require written Rx	Require written Rx	Require written Rx	UNK	Require written Rx	Require written Rx
Mail Order Pharmacy	NO	YES	NO	NO	YES	UNK	NO	NO
Drugs Bundled into Nursing Home Charges?	NO	NO	YES (OTCs)	NO	NO	UNK	NO	YES (OTCs)
% Capitation of Medicaid Recipients	0	18	0	0	0	UNK	12	0

## NOTES:

CN = Categorically Needy

MN = Medically Needy

<sup>1</sup>Missouri responses imputed from Pharmaceutical Benefits Under State Medical Assistance Programs, 1993.<sup>2</sup>Includes out-of-state pharmacies allowed to fill Kentucky prescriptions.



TABLE 7-2

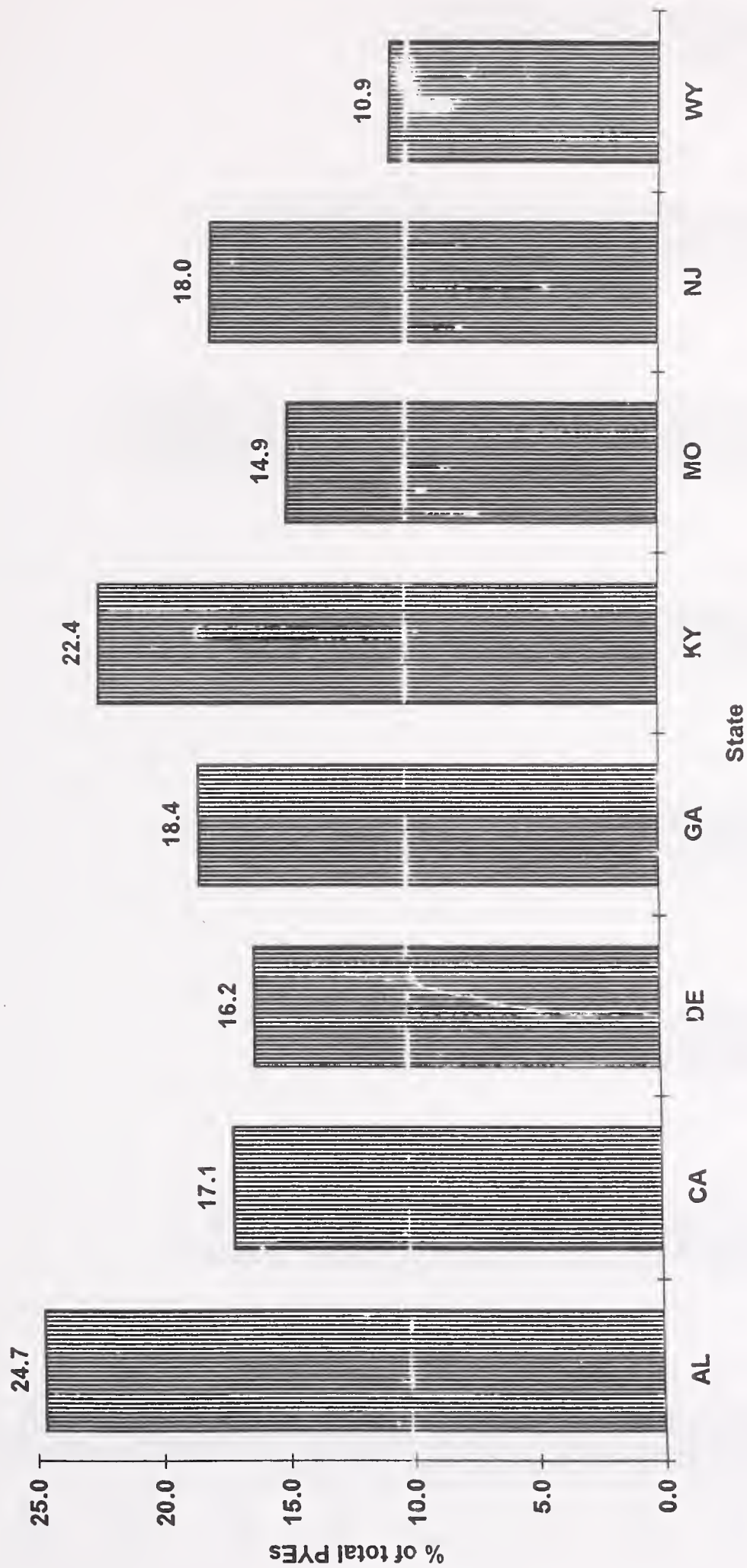
## PHARMACY REGULATORY POLICY PROVISIONS, 1992

Characteristic	Alabama	California	Delaware	Georgia	Kentucky	Missouri <sup>1</sup>	New Jersey	Wyoming
# Rx's/month	No limit	6	No limit	5 - 6	No limit	No limit	No limit	No answer
# Refills	5	No limit	No limit	No answer	5	No limit	5/6 mos.	No limit
Days supply limits	34 days	100 days	No limit	31 - 35 days	30 days for chronic drugs	100 units or 34 - 90 days	100 Units or 60 days	30 - 90 days
Copayments	\$0.50 - \$3.00	\$1.00	None	\$0.50	None	\$0.50 - \$2.00	None	\$1.00
Prior Authorization	No	Yes	No	Yes	Yes	No	Yes	No
Post-OBRA 1990 Formulary	No	Yes	No	No	Yes	Unknown	No	No agreements reached
Prospective Drug Utilization Review	No	No	No	No	No	Unknown	No	No
Voluntary (V) or Mandatory (M) Generic Substitution	V	M	V	V	M	Unknown	M	V

NOTES: <sup>1</sup>Missouri responses imputed from Pharmaceutical Benefits Under State Medical Assistance Programs, 1993.



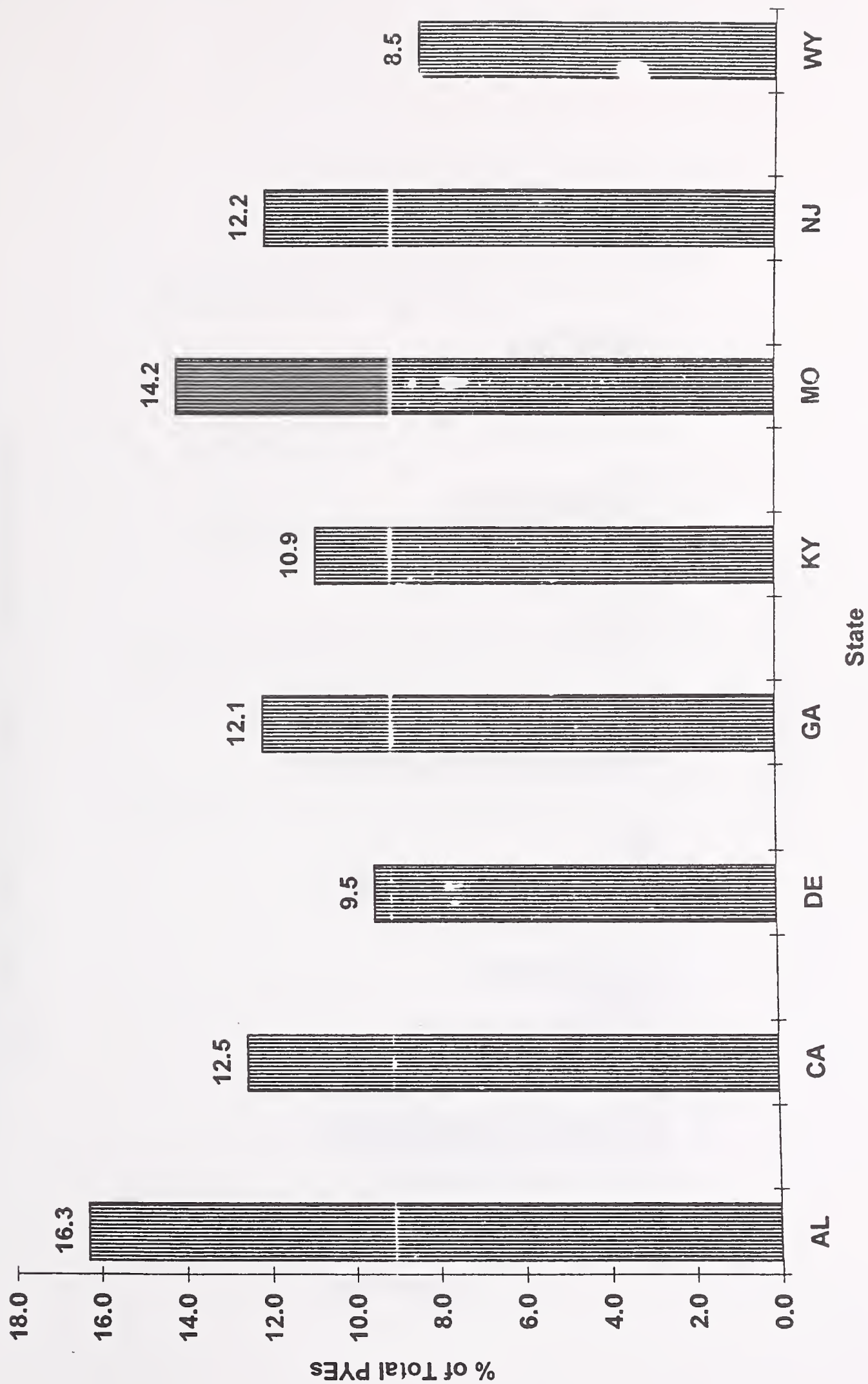
**EXHIBIT 4-1**  
**DISTRIBUTION OF BLIND AND DISABLED**





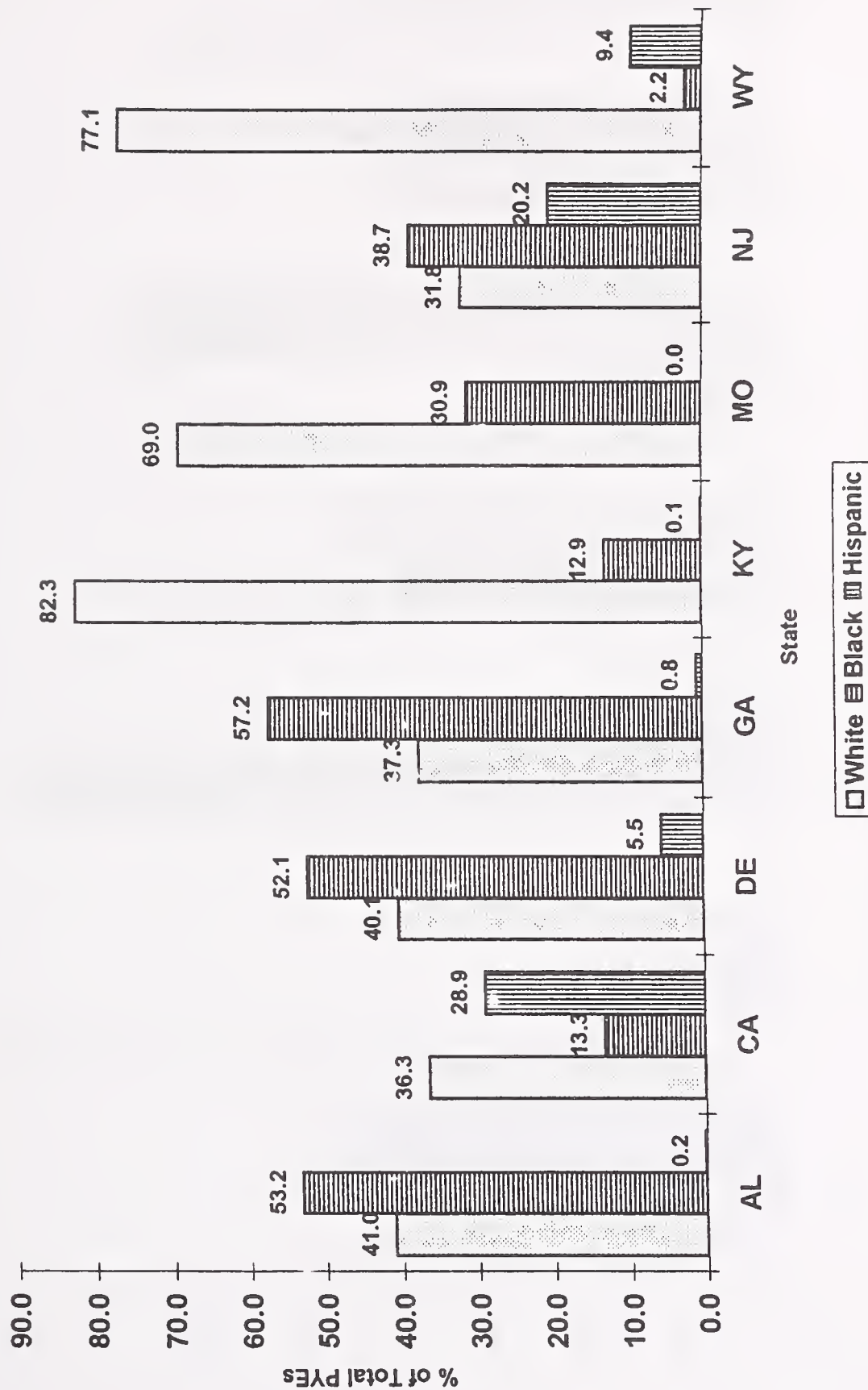


**EXHIBIT 4-2**  
**DISTRIBUTION OF THE AGED**



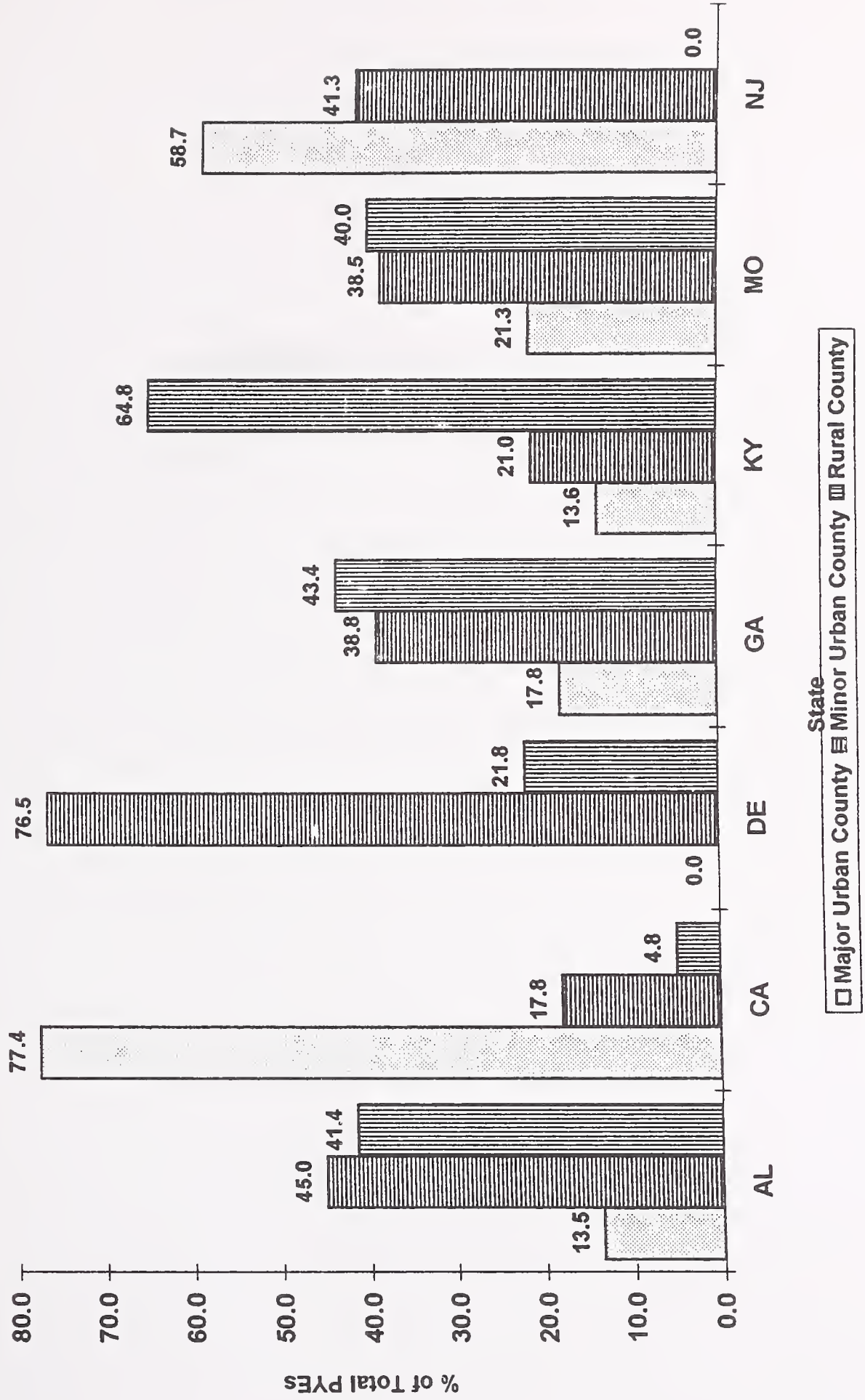


# EXHIBIT 4-3 DISTRIBUTION OF ENROLLEES BY RACE





# EXHIBIT 4-4 DISTRIBUTION OF ENROLLEES BY RESIDENCE







## APPENDIX A



## APPENDIX A

### MULTIVARIATE ANALYSIS METHODOLOGY

We used weighted least squares regression to analyze rates of use and spending at the county level. County level summaries of the data were constructed using the person level file. For example, spending per PYE (one of the dependent variables) at the county level is constructed by dividing the total Medicaid spending on prescription drugs in that county divided by the total number of PYEs (person-year equivalent enrollees). Similarly, utilization per PYE is the ratio of total number of Medicaid prescriptions dispensed in that county divided by total PYEs. The third dependent variable is cost per prescription which is simply aggregate spending divided by total number of prescriptions dispensed in the county.

Independent variables were also constructed at the county level. For example, the proportion of PYEs in the age range of 6 to 13 years is constructed by dividing the total PYEs in that age range by total PYEs for the county. Several PYE proportion variables were used as listed in Table 5-8. An aggregate PYE to total county population variable called MEDICAID was also constructed. There were also two binary variables indicating if the county was a major urban or minor urban county (rural county dummy was omitted). Finally, based on the Area Resource File, we created health care supply variables (density of physicians and hospital beds), hospital admissions rate for the county, population density, and area income (expressed in log).

In selecting the variables to be used as independent variables, we had to examine their distribution across counties. For example, some variables used in descriptive analysis (e.g., unknown age or gender) had positive values in only a handful of counties. Including those variables would bias the estimates associated with those and related variables because of a large concentration of zeros. By the same token, other variables could have very little variation and would not provide a reliable estimate. Another selection was done to eliminate potential collinearity. Since many BOE categories correspond fairly well with age, we decided to use age categories and use only the blind and disabled categorization. Finally, some included variable (e.g., proportion of black enrollees) had a very large dispersion across counties. Some counties had zero black enrollment and others had very high enrollment. Such bi-modality of the distribution also creates potential problems in estimation. (This problem may explain in part why black/white difference is not significant in the multivariate analysis).



Since the variables are aggregated and analyzed at the county level, we have potentially different variances for each observation (see Maddala, 1977, pages 268-270 for heteroscedasticity and grouped data). The model we are estimating is as follows,

$$\bar{y}_i = \beta' \bar{x}_i + \bar{u}_i$$

where  $i$  subscripts the county. Each county is different in size (both in terms of county population and Medicaid enrollment). We do not want to put equal weight to each county because there may be a small county with very few Medicaid enrollees living in it. Conversely, there may be other counties with a large Medicaid population. If we treat each observation equally (unweighted regression), we are putting as much weight in the small county as the large one. In order to weigh county observations based on size, we need to take the varying Medicaid population size into account.

In grouped data, error variances tend to be heteroscedastic. Thus,

$$\text{Var}(\bar{u}_i) = \frac{\sigma^2}{n_i}$$

where  $n_i$  is the size of the county Medicaid population (as measured by total person-year-equivalent enrollees). To remove heteroscedasticity, we decided to use county Medicaid population as the weighting variable. Using this approach, each observation in the weighted regression is weighted by the square root of the county Medicaid population,  $\sqrt{n_i}$ . An observation for a county with more enrollees is weighted more heavily than the one with a small number of enrollees. The advantage is that the error variances in the regression are then equal (homoscedastic). Note that

$$\text{Var}(\sqrt{n_i} \bar{u}_i) = \sigma^2.$$

There is another advantage of this approach. Since counties with more population will have a smaller variance, rates and proportions for those observations are more stable and they are accordingly weighted more heavily.





## **APPENDIX B**



## APPENDIX B

### Survey of State Medicaid Drug Benefits Program Administrators

1. How many pharmacies are there in your state? \_\_\_\_\_
2. How many pharmacies in your state participate in Medicaid? \_\_\_\_\_
3. Which of the following Medical Assistance Status/Basis of Eligibility categories are eligible for Medicaid drug benefits? (Check all that apply.)

Categorically Needy

- ☐ AFDC Child  
☐ AFDC Adult  
☐ Blind  
☐ Disabled  
☐ Aged  
☐ Qualified Medicare Beneficiaries (QMBs)  
☐ Other Aged  
☐ Other

Medically Needy

- ☐ AFDC Child  
☐ AFDC Adult  
☐ Disabled  
☐ Aged  
☐ Other

4. Are Over-the-Counter (OTC) drugs reimbursed under Medicaid? ☐ All ☐ Some ☐ None

If covered by Medicaid, does the reimbursement of OTCs

- ☐ require a written prescription  
☐ require prior authorization  
☐ Other requirements (SPECIFY): \_\_\_\_\_  
 \_\_\_\_\_

5. How many prescriptions may a Medicaid beneficiary legally receive per month?

1 2 3 4 5 6 7 8 9 >10 No Limit

6. How many refills may a Medicaid beneficiary receive per prescription?

1 2 3 4 5 6 7 8 9 >10 No Limit

7. How many days supply may a Medicaid beneficiary receive per prescription? \_\_\_\_\_ days

8. Does the day supply vary by

Medication used for acute purposes?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> Days supply
Medication used for chronic purposes?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> Days supply
Hospital discharge medications?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> Days supply
Mail order prescriptions?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> Days supply
Other: _____	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> Days supply

9. Does the Medicaid program have a patient co-payment provision? ☐ YES ☐ NO

• If YES, what is the copay? \$ \_\_\_\_\_

PLEASE GIVE RANGE IF COPAY VARIES BY DRUG OR PATIENT ELIGIBILITY \$ \_\_\_\_\_ to \$ \_\_\_\_\_



- Please check any **exemptions** to who must pay a copayment.
- ☐ Medicaid recipients who are children
- ☐ Medicaid recipients in long term care facilities
- ☐ Pregnant Medicaid beneficiaries
- ☐ Medicaid beneficiaries requiring family planning drugs and supplies
- ☐ Other (SPECIFY): \_\_\_\_\_

10. Does the state provide Medicaid recipients with a mail order option? ☐ YES ☐ NO

- If YES, what drugs are eligible under mail order?
- ☐ All prescription drugs
- ☐ Prescription drugs used for chronic (maintenance) conditions
- ☐ Prescription drugs used for acute conditions
- ☐ Other (SPECIFY): \_\_\_\_\_

11. Are prescription and other reimbursable drugs bundled into nursing home per diem rates?  
☐ YES ☐ NO

- If YES, which categories of drugs are bundled? (Check all that apply.)
- ☐ All prescription drugs
- ☐ Over-the-counter drugs
- ☐ Medical supplies
- ☐ Other (SPECIFY): \_\_\_\_\_
- If YES, do long-term care facilities have the option to bundle?
- ☐ YES ☐ NO

12. What proportion of Medicaid eligibles receive care through an HMO or other capitated program? \_\_\_\_%

The following questions pertain to the Medicaid prescription drug benefit program's ability to contain the use and costs of covered drugs in your state.

13. Does the program in your state use the following management strategies to control the use and costs of prescription drugs?

(Please check all that apply.)

- ☐ Retrospective Drug Utilization Review (DUR)
- ☐ Mandated generic substitution
- ☐ Voluntary generic substitution

14. Does the state operate a prior authorization program? ☐ YES ☐ NO

- If YES, which drugs require prior authorization?
- ☐ Anorectics/CNS Stimulants
- ☐ Tranquilizers (including benzodiazepines)
- ☐ H2 Antagonists
- ☐ Non-steroidal Anti-inflammatory Agents
- ☐ Narcotics
- ☐ Antivirals
- ☐ Antibiotics
- ☐ Medical supplies
- ☐ Infertility agents
- ☐ Investigational new drugs
- ☐ Other (SPECIFY): \_\_\_\_\_





15. In regard to the Omnibus Reconciliation Act (OBRA) of 1990,

- Did the state maintain a limited formulary after "best price" agreements were reached with various manufacturers?

\_\_\_ YES \_\_\_ NO \_\_\_ No agreements were reached.

16. In 1992, did the state conduct any intensive prospective drug utilization review programs for drugs or drug categories reimbursed by Medicaid? \_\_\_ YES \_\_\_ NO

- If YES, for what drugs or drug categories was DUR conducted?

\_\_\_ Anorectics/CNS Stimulants

\_\_\_ Tranquilizers (including benzodiazepines)

\_\_\_ H2 Antagonists

\_\_\_ Non-steroidal Anti-inflammatory Agents

\_\_\_ Narcotics

\_\_\_ Antivirals

\_\_\_ Antibiotics

\_\_\_ Medical supplies

\_\_\_ Infertility agents

\_\_\_ Investigational new drugs

\_\_\_ Other (SPECIFY): \_\_\_\_\_



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